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British Empire Exposition at London

Engineering Exhibits Include Wear Tests of Stainless Steel Turbine Blades, Alloy-Steel Shafts Requiring No Machining, Centrifugally Cast Steel Wheels

(Special Correspondence)

MANY representative engineers from the United States who have been attending the various conferences held at Wembley, England, this summer are unanimous in their praise of the British Empire Exhibition, which marks a definite stage of the history of British industrial achievement. The beginnings of this exhibition go back 14 years when representatives from the overseas dominions combined with men prominent in politics, education and business in Great Britain to organize an empire exhibition on a large scale. The year 1915 was then selected as the date of the exhibition, but the outbreak of the war in 1914 quickly put an end to all the preparations. No sooner, however, had the war terminated than proposals were renewed, and as the outcome of a conference of Ministers of the United Kingdom and representatives of all the great dominions held in London in 1919, it was unanimously resolved that the exhibition was desirable.

The grounds of this resolution were expressed to be to stimulate Imperial trade by helping manufacturers to secure a larger share in the growing markets of the dominions and to help in developing resources within the Empire that were only partly developed or not developed at all, also to provide a memorial of the part the Empire had played in the war in demonstrating its unity and its resources.

A general committee was formed in the year 1920, and it was arranged that, while the direction of the exhibition was to be entrusted solely to the executive committee, its final constitution was to be subject to the approval of the board of trade, which was also to approve all regulations affecting the participation of overseas dominions and the entry of British exhibitors. The sum of £600,000 was subscribed to the guarantee fund from various sources, including £100,000 subscribed by the Board of Trade. The work of preparing the site at Wembley Park was begun in January, 1922, and the exhibition was opened by the king in April last, although it was not until some time later that it was finally completed.

In This View of the Wembley Exposition the Large Area to the Left of the Axial Thoroughfare Is the Palace of Engineering. Immediately opposite and at the right of the picture is the Palace of Industry. Behind the Palace of Engineering or further in the background is the Canadian Building and back of the Palace of Industry is the building of Australia

Of all sections of the exhibition, the exposition of the engineering trade in the Palace of Engineering is, perhaps, the most comprehensive, the most complete. The building itself is a concrete building of no less than a floor space of over five acres,* comprising the exhibits of more than 400 firms. Five full-size railroad lines, connecting with the main trunk lines of the coun-

*The U. S. Army base, built during the war at Brooklyn, N. Y., comprises two connecting nine-story concrete buildings, having a total of over 100 acres of floor space. The Navy base nearly has over 50 acres of floor space. A Government office structure in Washington has 42 acres of floor area. These buildings were a part of the war program and were built by the Turner Construction Co., New York.

A PART of the Facade and an Interior of the Palace of Industry of the British Empire Exposition

try, traverse the building from end to end. Here the shipbuilding, marine, mechanical and general engineering exhibits have been organized by the leading trade associations, and a joint committee of the non-ferrous metal trades with the assistance of seven trade associations, have organized a comprehensive exhibit, showing in copper, brass, nickel-silver and their alloys, both the primary products of the mills and the chief uses to which they are put.

A space of 1500 sq. ft. also has been placed at the disposal of the National Physical Laboratory, in which is displayed a collection of apparatus and specimens illustrating the applications that have been made at the laboratory of physical sciences to the practical solution of engineering, metallurgical and shipbuilding problems. Foundry practice is represented by small cupolas heated by gas and coke, by molding machines and other appliances employed in the melting and casting of metals.

Structural engineering is illustrated in a wide range of activities, together with the operation of pneumatic tools; large forgings, castings and stampings reveal the class of work that is undertaken in British engineering shops, while groups of machine tools demonstrate how the rough material from the foundry, the steam hammer, the hydraulic press, and the smithy are turned, faced, drilled and shaped into some part of the finished machine.

All these appliances are grouped together in the general engineering section, which forms one of the main sections into which the Palace of Engineering is divided, the other sections being (1) electrical engineering and (2) transport. In addition, the power house itself is a comprehensive collection of generating plant and equipment due to the cooperation of a large number of independent firms.

The Palace of Industry has its exhibits arranged in 23 groups, most of which have been organized either by one or a combination of trade associations or by a special committee. In the Government pavilion is to be found exhibits by 22 Government departments, including exhibits dealing with the progress of pure science.

The metallurgical exhibits illustrate every phase of manufacture from the pig iron to intricate forgings, castings and rolled products of every conceivable section. They include specimens of the most modern alloys, whose properties are due both to actual manufacture in the liquid state and to subsequent treatment; it may be added that the special alloys displayed are not merely laboratory products, but are samples of actual commercial, every-day manufacture.

An interesting selection of different types of turbine blading is to be seen. One specimen is an actual section of 12 blades, from a 2000-kw. turbine, the steam pressure in which was 200 lb. and the superheat 200 deg. Fahr. The blades marked 1, 2 and 3 are of 5 per cent nickel steel and were inserted on June 11, 1920, the actual hours run being 12,809. Those marked 4, 5 and 6 are of stainless steel and were inserted on the same day. The blades marked 7 to 12 are 5 per cent nickel steel; they were inserted in August, 1916, and have run for 29,989 hr. The nickel steel blades which were inserted in 1916 are worn out. Those which were inserted in 1920 bear very marked signs of erosion, being rough and pitted, the edges showing distinct signs of fraying. The stainless steel blades, on the other hand, are as new and bright as on the day they were in-

ONE of the Avenues of the Large Concrete Building Known as the Palace of Engineering

serted. The edges have retained their initial sharpness, no signs of wear being apparent anywhere. Numerous other comparative exhibits are shown of a similar nature pointing to the advantages to be derived by the use of stainless steel.

An exhibit of interest to motor car manufacturers is of a heat-treated, alloy steel, back-axle shaft rolled and reeled to such fine limits of size and straightness that it can be put into service without any further machining beyond fitting the ends for attachment to the gear and hubs. Tests on this steel show a maximum stress between 110,000 and 155,000 lb. per sq. in.

A specimen of the Davis one-piece steel railway wheel made in Sheffield is also shown, the manufacturing rights having been acquired from the United States owners. The tire and wheel center are in one piece, but as a result of the process of manufacture by a centrifugal casting process, the manganese content of the steel is confined to the tread and flange, the plate center and hub of the wheel being entirely of mild steel. After annealing the wheel and machining the tread and flange, the wheel undergoes a special heat treatment which makes the tread and flange tough, hard and resistant to wear, while the center and hub become tough and ductile.

An attractive exhibit is one of steel specimens, on the top of which is a model one-thirtieth of the full size of a blast furnace plant unit, showing the blast furnace with all the auxiliary appliances, including a skip charging apparatus, hot blast stoves, calcining kilns, overhead gantry and rolling stock. A slag brick wall, vases and other work illustrate the possibilities in store for blast furnace slag.

In the machine tool section a spindle-molding machine for making wood moldings is shown, the spindle being turned from a solid cast-steel bar and running on ball bearings. The cutter slide is raised or lowered by means of a screw working through a threaded hole in an extension of the casting at the foot of the spindle. The hand-wheel for this purpose is conveniently placed and a locking screw is provided to keep the spindle in place at any setting. The table is 24 in. square and has two planed grooves across it to slide the fences or guides across. Each of these fences is fitted with a sliding front plate so that the opening between them may be regulated. The spindle is run at a speed of 5000 to 6000 r.p.m., which insures good finish in the work.

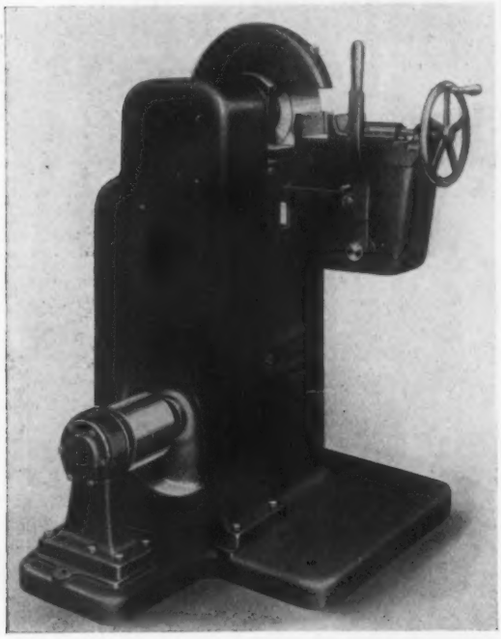
Another interesting exhibit is a gear-shaping machine designed to generate a range of gears which normally could not be produced by a single tool. It will cut external gears from zero to 44 in. in diameter and 6 in. deep and internal gears to 50 in. in diameter and 4 in. deep. The pitch range is from 48 to 3 for diametrical pitch, 1/16 in. to 1 in. for circumferential pitch and 1 to 8 for module wheels. The dimensions of the bed of the machine on the floor are 2 ft. 10 in. by 4 ft. 6 in. and the projected floor space is 3 ft. 3 in. by 6 ft. 6 in. The overall height is 7 ft. and the weight 4150 lb.

In its wider aspects, the British Empire Exhibition serves to emphasize the movement that has set in toward England's manufacturing as much as possible from raw materials produced within the Empire and for the development of means for the exchange of such products to the mutual benefit of all the communities concerned.

High-Speed Cutting-Off Machine

Heavy construction and excellent balance, resulting in unusual economy in wheels and blades, are features claimed for the cutting-off machine illustrated, which has been placed on the market recently by the Cochrane-Bly Co., Rochester, N. Y. All shafts and spindles are mounted in Timken roller bearings in dust proof cases and the pulleys, which are of the solid web type, are turned all over and balanced.

The machine will accommodate an abrasive cut-off



Cutting Off Machine. Abrasive disks, toothed saws or friction disks up to 16 in. in diameter may be employed

disk, a toothed saw or a friction disk, the wheels or blades employed being 16 in. in diameter. The abrasive wheel is used to cut hardened drill rod, unannealed tool bits, magnet steel, monel metal, and various other hard and soft metals. The toothed blade is used to cut copper and brass wire, rod, tubing, aluminum, rolled steel moldings and similar materials and the friction disk is for cutting angles, channels and other rolled sections, also wire, rods and tubing.

The adjustable vise has the capacity to hold tubing and other material up to 4 in. in diameter. The speed at which the spindle runs varies from 2500 to 6500 r.p.m., according to the wheel used and material to be cut. The machine may be equipped for either belt or motor drive, the latter requiring either a 5 or 7½ hp. motor, depending on the operating speed.

Decline in Production of Steel in Dominion of Canada

Despite the claims made from time to time that Canada could develop its steel industry to a point where the Dominion would rank second to the United States as a producer of this basic material, the production of steel in Canada has declined to a level below that which prevailed before the World War. In 1913 Canada produced 1,044,000 tons of steel; by 1918 production amounted to 1,873,000 tons, but since that year there has been a steady decline, until 1923, when the output amounted to but 884,000 tons. In the first three months of the current year, production of steel amounted to only 207,000 tons. This record was established despite the claims made during the Great War that the industry would be developed to a point of 10,000,000 tons capacity. Steps are under way at the present time, however, to revive the steel-making industry of Canada. Interests associated with the industry recently called attention to the ore and coal reserves of the Dominion, the extensive and extending consumption of steel products and the possibilities of Canada becoming an exporter of steel products.

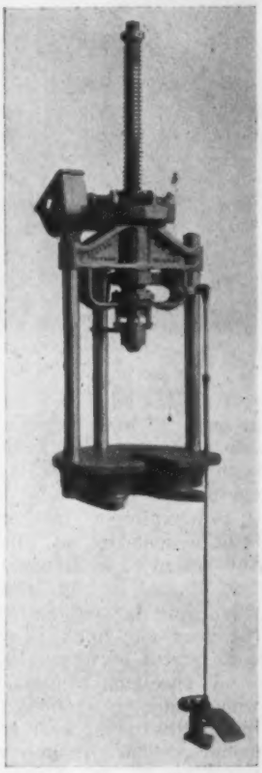
Production of Copper in Canada

During the year 1923 the production of copper in Canada amounted to 86,881,637 pounds, which at the average New York prices for the year of 14.421c. per lb. had a value of $12,529,186, according to revised figures of the Dominion Bureau of Statistics. These figures compare with a production of 42,879,818 lb., valued at $5,738,177, or an average price of 13.382c. per lb, for the year 1922. The increase amounted to 103 per cent in quantity and 118 per cent in value. The figures for 1923 have only been exceeded in the four-year period, 1915 to 1918, when the production, due to the war conditions, was well above 100,000,000 lb. annually.

New Three-Ton Power Arbor Press

The General Mfg. Co., Detroit, has recently added to its line the 3-ton bench-type power arbor press shown in the accompanying illustration. The machine will take up to 14 in. in diameter between the posts. The distance between the table and end of the ram is 12 in. and the stroke of the ram is 6 in.

The press may be provided either on a stand or column or for mounting on lathe bed. The drive may be by belt as shown in the illustration, or by motor mounted on a bracket with silent chain connection. In addition to arbor press work the press may be employed for straightening, pressing-in bushings and other assembly work.



The machine is controlled by foot pedal, by which the pressure exerted may be varied from a few pounds to three tons. The ram is driven at constant speed in one direction by a worm drive and spline keys. The ram nut, which is also the brake drum, revolves with it until pressure is applied to the foot pedal which stops the nut. The ram screws down through it until the foot pedal is released or the brake band slips at any ram pressure, depending on the amount of pressure applied on the foot pedal. On release of the foot pedal the ram is returned by a compression coil spring, the nut spiraling on the long lead thread of the ram. At the upper end of return stroke a brake serves to stop the nut and prevent shock.

The table of the machine is heavily ribbed, and is provided with an opening 3 in. wide and with six tapped holes for bolting down fixtures. The head, also heavily ribbed, is tied to the table by three steel posts as shown. The drive pulley is mounted on the worm shaft, the steel worm driving a bronze worm gear running in grease in an inclosed case on the top of the head and it in turn driving the ram by two spline keys. The ram has a six-start acme thread which delivers the power by screwing through the friction nut mounted below the head. The thrust of the nut is taken on a suitable ball bearing between it and the head. The ram anvil is held from turning by a torque lever sliding on the third or back post. The weight of the machine is 400 lb. The opening in the table and stroke may be made to other dimensions, to suit requirements.

Industrial Field in World Power Meeting

Electrolytic Deposition of Iron, Electricity in Steel Making, British Iron Ore Resources and Roller Bearings Discussed

LONDON, ENGLAND, July 8.—The World Power Conference held in London during the first two weeks of July has attracted widespread attention. Power experts from all parts of the world have assembled, under the auspices of the British Electrical and Allied Manufacturers Association, and have discussed how the industrial and scientific sources of power may be adjusted nationally and internationally. For this purpose the potential resources of each country in hydroelectric power, oils and minerals have been reviewed while the development of these resources and their distribution and utilization has been discussed.

The Earl of Derby was president of the conference, and a representative delegation was present from the United States, headed by O. C. Merrill, executive secretary Federal Power Commission.

Contribution by Secretary Hoover

Technical problems in connection with power production were not alone discussed, and a good deal of time was devoted to the consideration of the more difficult questions which arise in the fields of finance, administration and public relations. Secretary of Commerce Herbert Hoover presented a contribution which stated that the work of centralization of power development and distribution through the medium of great power systems would make possible the decentralization of industry and eliminate the crowded urban conditions and congested terminals which had been brought into existence by the use of direct steam power in factories and workshops. He defined the function of government as being to provide an open road for the exercise of individual initiative, to regulate and control, but not to manage or operate. He added that until a liquid flow of power into national channels of consumption was provided, there would be permanently large costs on industry, less reliability of service, and an imperfect utilization of natural resources.

This view was shared by Dr. A. T. Hadley (ex-president of Yale University), who urged that as an industry became more progressive and experimental in its character the danger of government ownership was very great, and regulation rather than direct operation had been on the whole a successful solution.

British Empire's Iron Ore Resources

Some idea as to the magnitude of the world power conference may be gathered from the fact that over 400 papers were presented and in this brief survey it is impossible to do more than indicate some of the main features of metallurgical interest. Thus, Prof. Henry Lewis, who summarized the resources of the British Empire in the metals that are required for the production of machinery employed in the generation of power, estimated Britain's stores of iron ores as equal to 2200 million tons of iron. In normal times Britain produces from 8 to 10 million tons of pig iron yearly, which is approximately one-seventh of the world's total production; about one-third of this production is smelted from imported ores, and if it is assumed that this state of affairs continues, British domestic supplies would correspond to the requirements for over three centuries. One of the questions which the future will have to solve is the extent to which it will become possible to utilize material which today is considered too poor in iron to rank as an iron ore, but which, nevertheless, in case of need could be employed as a source of iron.

The development of electro-metallurgical processes in the United States of America was described by E. P. Mathewson, New York. There are over 200 cities and towns in which power is used for this purpose, the installed capacities that are now operating (1924) being shown in the following table:

	Installed Electrical Horsepower
Pig iron, electric smelting	.....
Steel, electric refining	450,000
Ferroalloys, electric smelting	150,000
Aluminum, electrolytic production	350,000
Copper, electrolytic refining	75,000
Brass, electric melting	82,000
Lead, electrolytic refining	1,200
Zinc, electrolytic production	34,000
Gold and silver, electrolytic refining and electric melting	1,300

Electrolytic Deposition of Iron

T. W. S. Hutchins (Great Britain) examined three processes for the commercial production of electrolytic iron in tubes and sheets. With regard to the French process, wherein the anodes are formed (cast or shaped) and are soluble so that the iron deposited from the electrolyte is replaced by solution of these anodes together with the iron in the absorbers or recuperators, he considered that while this calls for extreme delicacy in control it has nevertheless proved to be a practical one, inasmuch as satisfactory iron tubes are being produced. It may be that with careful control a current efficiency equal to that of others, say, 95 per cent, may be obtained. The operating voltage appears to be about 2.3.

He next considered the American process, devised by Frank Augustus Eustis, wherein the anodes are shaped, but insoluble, so that the whole of the iron deposited from the electrolyte is replaced by solution of the iron in the recuperators. No data is available giving the consumption or relative consumption of ore, scrap iron and limestone per ton of metal deposited, and while it is stated that with right conditions a current efficiency of 95 per cent is obtained, presumably that efficiency does not allow for expenditure of electrical energy in the electrolytic reducing tank.

Hutchins finally described the British process wherein the anodes are soluble but unformed, so that the iron deposited from the electrolyte is replaced by solution of these anodes together with the iron in the recuperators.

Electricity in Steel Making

F. A. J. Fitzgerald (past president, American Electrochemical Society) described the development of the hydroelectric system of the Niagara Falls Power Co. and of the industries to which power from this source has been supplied. He referred to the manufacture of steel castings as illustrating his contention that very low temperature processes can be carried out more cheaply with electricity than with fuel. The manufacture of electric steel for casting requires much higher temperatures than those required for melting non-ferrous alloys such as brass and bronze; but in spite of that electric heating competes successfully with fuel, even in places where the cost of electric energy is relatively high.

W. Geyer (Germany) discussed the importance of electrical engineering in the development of modern steel works. He claimed that the combination of the gas engine with the electric generator has proved to be the most economical means of utilizing the energy contained in blast furnace gas. Centralized electric supply leads to the decentralization of air supply. Electric driving completely alters the layout of rolling mills and directly influences the rolling process. He showed that the transmission of the energy over distances as they occur in steel works does not entail a loss of more than ¼ to 1 per cent in the cost of high

tension three-phase current. The electric motor, when running light, does not take more than about 3 per cent of its normal output. On the other hand, tests in a large steel works equipped with modern steam pipes have shown that on a Sunday when all the mill engines were disconnected from the mills and were running light, 60 per cent of the steam required for normal full load working was consumed. The individual steam engine for running light took about 20 per cent of the steam required for full load. The remaining 40 per cent was lost in the steam pipes. Mr. Geyer remarked that the electric steel furnace has become a rival of the smaller open hearth furnace; used in conjunction with converters, it holds out prospects of cheap, high-quality steel.

Power of Future for Iron and Steel Industry

Barton R. Shover (past president, American Association of Iron and Steel Engineers) dealt with the use of power in the iron and steel industry in America. He estimated that the steel industry consumes, for power purposes only, more than 12,400,000 tons of coal per year for the average production; over 15,900,000 tons for maximum production; and, should all plants operate to capacity, nearly 21,400,000 tons. The consumption of electrical energy in rolling mills was given as 2,500,000,000 kwhr., of which 17 per cent was purchased from power companies. A marked feature of the electrification of rolling mills was almost exclusive adoption of turbo-generators in new installations; of the 21 mills equipped since 1918, 19 were electrically driven. The following are deduced as the present, and probable future, tendency of power generation and application in the iron and steel industry:

Electrification of all power-driven apparatus, except blast furnace blowers.
Substitution of turbo-blowers, or possibly gas engines, for reciprocating steam blowing engines.
Purchase of power requirements by plants which have no waste heat available.
Complete economical utilization of waste heat by means of turbo-generators for electric power generation, except where this heat can be used to better advantage for "process" or has a market value greater than its coal equivalent.
Interchange of electric power between plants generating power from waste heat and public service companies.

Dr. Carl Köttgen, who described the applications of electric power in German industry, enumerated the advantages of electric power transmission. He showed that in electrically operated reversible rolling mills the easy and quick control led to an increase in production, the same tendency making its appearance in connection with continuous rolling mills. The electric motor, on account of its overload capacity, maintains a speed at a much more constant level than was the case when rolling mills were driven by steam. The feeding of the material to the rollers is much easier. The workers can rely upon their manual operations corresponding with the speed of the rolls. In metal working it is possible to adjust the cutting speed in relation to the progress of the operation, especially when the regulation is carried through easily and directly from the working place of the workman.

Power Saving by Using Antifriction Bearings

Uno Forsberg dealt with the question of saving power by the use of antifriction bearings, basing his remarks chiefly upon experience gained in connection with the Swedish State Railways and hot rolling mills for iron and steel. The trials in connection with the latter were made at Witkowitz in Czecho-Slovakia. Swedish spherical roller bearings were mounted in 1921.

The proposed application included the three last pairs of housings for a two-high small mill with a roll diameter of 280 mm. and a speed of 480 r.p.m. The maximum pressures amounted to 12 tons in rolling 8 to 10 mm. round bars, and 25 tons in rolling flat iron. Up to and including January, 1923, about 2000 tons of wire had been rolled per year, and about 1800 tons of flat iron. In November, 1922, roller bearings were mounted in the last pair of housings. In this case the roll diameter was 450 mm., speed 250 r.p.m. and maximum pressure about 30 tons. Up to March, 1923, about 1700 tons had been rolled.

Tests have also been carried out at Hofors steel mill in Sweden, and about 1000 tons have been rolled in a two-high mill with 225 mm. rolls. According to measurements made of the pressures, the bearing loads amount to a maximum of 8 tons, and an average of 5 tons. It was estimated that the cost of constructing a wire mill consisting of a 430-mm. roughing mill (two pairs of housings) and a 250-mm. finishing train (six pairs of housings) with roller bearings, will be increased by 10 per cent, but about 45 per cent of power will be saved. In cases where the rolling mills use coal, which is more costly than electrical power, the saving is correspondingly greater.

Power and Engineering Exposition in December

Some 260 exhibitors have been assigned space for the third National Exposition of Power and Mechanical Engineering, which will be held in the Grand Central Palace, New York, from Dec. 1 through Dec. 6. This number is more than two times greater than the number of those who had engaged space on Aug. 1 a year ago.

The exposition will, as usual, parallel the meetings of the American Society of Mechanical Engineers and the American Society of Refrigerating Engineers. The A. S. M. E. meeting will be held in the Engineering Societies Building, 29 West Thirty-ninth Street, New York, and the A. S. R. E. meeting will be held at the Hotel Astor, New York. Plans are under way for the American Society of Heating and Ventilating Engineers to have a gathering of local sections during the time of the exposition.

The management of the exposition is assisted by an advisory committee of designing and operating engineers. For the coming exposition this advisory committee has been augmented by George A. Horne, New York, president of A. S. R. E.; Homer Addams, New York, president of the A. S. H. V. E., and John H. Lawrence, New York. Mr. Lawrence served on the committee the preceding year during his term as chairman of the power division of the A. S. M. E.

The American Society of Mechanical Engineers, the National Electric Light Association and the National Association of Stationary Engineers are already represented on the Advisory Committee by their officers. The A. S. M. E. delegation consists of the president, Fred R. Low; chairman of the professional divisions committee, James Partington; chairman of the power division, Nevin E. Funk, and the secretary, Calvin W. Rice. Fred W. Payne and Charles F. Roth are managers of the exposition, with offices in the Grand Central Palace, New York.

Steel Barrels, Drums and Tanks Manufactured in 1923

WASHINGTON, July 22.—The Department of Commerce announces that, according to reports for the biennial census of manufactures, 1923, the establishments engaged primarily in the manufacture of portable steel barrels, drums and tanks in that year reported such products valued at $22,714,824, together with other classes of products valued at $528,515, making a total of $23,243,339. The rate of increase in the total value of products as compared with 1921, the last preceding census year, was 60 per cent.

In addition, portable steel barrels, drums and tanks were manufactured to some extent as secondary products by establishments engaged primarily in other industries. The value of these commodities thus made as secondary products in 1921 was $1,678,650, an amount equal to 11.6 per cent of the total value of products reported for the industry proper. The corresponding value for 1923 has not yet been ascertained, but will be shown in the final reports of the present census.

The Preece Test for Zinc Coated Materials

Recent Investigation Shows Its Unreliability as to Weight of Zinc—Stripping and Weighing Test Held to Be Most Reliable Index of Quality

BY W. M. PEIRCE*

THOSE familiar with the history of the Preece or copper sulphate dip test and the literature pertaining to it may feel that the writer has chosen a threadbare subject. But in spite of its condemnation by reputable authorities, this test continues in almost universal use for rating zinc coatings, particularly on wire.

Striking evidence of this widespread use came to the writer's attention recently in a manner which prompted this reiteration of previous condemnations of the Preece test, together with a presentation of some new data which explain one reason why it is not adapted for measuring the quantity of zinc coating on galvanized materials. The incident follows:

Evidence of Continuing Use

In the latter part of January of this year the American Engineering Standards Committee held a "conference on galvanizing and sherardizing of iron and steel," to discuss the development of nationally uniform specifications for various classes of galvanizing and sherardizing work. As an introduction to this discussion Roger F. Hosford presented a resumé of American and foreign practice in regard to specifications for these materials.

Mr. Hosford presented tables summarizing the important features of the specifications for sheets, wire and electrical construction material, adopted by the following well known organizations and agencies:

American Telephone & Telegraph Co.
American Railway Association.
American Electric Railway Association.
National Electric Light Association.
British Engineering Standards Association.
U. S. Signal Corps.
Dutch Ministry of the Colonies.
Belgian Standardization Association.
Preece and Silverwright (3rd edition) "Telegraphy."

In the specifications for wire and electrical construction material the Preece test is the only test mentioned for determining the thickness of coating.

In the four galvanized sheet specifications examined one permits the use of the Preece test only and a second gives it as one of two permissible methods.

This seems to the writer ample evidence of the continuing widespread use of this seriously discredited test.

Adverse Opinions of Authorities

It is of importance to consider next the published opinions of competent authorities who have studied the Preece test.

Committee A-5, sub-committee II, of the American Society for Testing Materials[1] investigated various methods of testing zinc coatings. In 1911 in a preliminary report they unanimously condemned the Preece test as unreliable for testing sheet and plate, though stating that it may have a certain comparative value in testing wires if properly manipulated. A later report (1917) does not offer any new conclusions.

It is difficult to see why a test which is unreliable on sheets should be reliable in the case of wire. The coating on wire, it is true, is ordinarily more uniform than on sheets but as will be shown later the Preece test can be relied on only as a means of indicating the degree of uniformity of the coating.

Others have called attention to the unwarranted significance attached to the results of this test[2],[3] the most comprehensive statement of the case coming from W. E. Hughes. This author expresses the writer's observations and consequent opinions so accurately that I take the liberty of quoting him at length: (The italics are the writer's).

> "This has been variously called Preece's, the Admiralty, and the Post Office test. It consists in dipping the zinc-coated article in a saturated and neutral solution of copper sulphate for a certain period of time * * * taken as the unit, holding it, after removal from the sulphate, under a water tap giving a flow at full pressure, and noting how many such dips can be given before a firmly adherent coat of copper becomes deposited upon the iron or steel base. * * * Precautions that must be taken when applying this test are: the zinc must be free from grease, oil and the like; the solution must be quite neutral—free, that is, from mineral acid, e.g., sulphuric; and a careful distinction must be made between the dark, loosely adherent copper that forms on zinc by exchange and which a fast-running stream of water will wash away, and the reddish, clean-looking (sometimes bright) deposit of copper that is formed, also by exchange, upon iron or steel. It is the latter that must be looked for.
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> Messrs. Watt and Philip[4] say: "It is necessary to carry out tests by this means with caution, or misleading results will be obtained." The unit of time often employed is one minute. It is stated by the same authorities that the amount of zinc required to be present on the surface of an electro-galvanized article, so to protect the iron or steel that it will withstand one 1-minute dip or immersion in the saturated copper sulphate at 15 deg. C., is about 0.166 oz. per sq. ft. of surface, while that required when the hot process is used is 0.248 oz. The reason for this difference is said to be the greater purity of the electro-deposited zinc. This test has been critically examined by several investigators.[5] It has been found to mislead, even when carefully carried out, *and it cannot help misleading if more is expected of it than that it shows whether the zinc is of even thickness all over the surface of the plated article.* Really it is not necessary to prove this, for one knows it *a priori.*
>
> All, then, the Preece test shows one is whether there are considerable variations of thickness, or whether this is the same approximately all over the surface of the plated article. It is satisfactory for that purpose and that is all. A few reasons why the test cannot give more information are the following: (1) The loosely adherent layer of copper that commences to be formed upon the zinc as soon as immersion occurs protects, in varying measure, the remaining underlying zinc, and thus causes the velocity of the reaction to be very irregular, so that it is quite impossible to say what quantity of zinc is dissolved in a certain unit of time. It is, therefore, with rough approximation only, true to say that one can estimate the weight of zinc per unit area from the number of dips given. (2) The velocity of displacement of copper by zinc depends upon (inter alia) the concentration of the copper in the solution. This is continually diminishing as copper is displaced and zinc goes into solution. The rate of diminution will vary with such conditions as volume of solution employed, temperature, and others. Hence, irregularity occurs from these causes also. (3) The copper forms with zinc a zinc-copper couple, which acts (again irregularly) to disturb the uniformity of the velocity of reaction. (4)

*Mr. Peirce prepared this paper as a contribution from the Research Laboratory of the New Jersey Zinc Co., to the current discussion concerning galvanizing and methods of testing zinc coatings.

[1] Proc. Soc. Test. Mat. 1911, XI, p. 100, and 1917, Part I, p. 144.

[2] Schlötter Zeit. f. Elektrochem., 1905, XI, p. 333.

[3] Modern Electro-Plating, by W. E. Hughes (1923) pp. 80-81.

[4] Electro-Plating, 1902, p. 633. (Crosby, Lockwood & Co.)

[5] For instance, I. Szirmay, Zeit. f. Elektrochem., 1905, vol. XI, p. 333.

> The actual carrying out of the test is not so simple as it would appear to be. The copper sulphate solution must be neutral; and some investigators find difficulty in distinguishing between the loose copper deposit formed on zinc and the adherent deposit formed on the iron or steel. Moreover, according to Schlötter,[6] *an adherent copper deposit can be formed on the zinc itself, which therefore does not, in cases, become completely dissolved, at any rate dissolves as to part of it very slowly.*

It may be added that the copper sulphate test has been dealt with at length here because it has been found that that is the one used almost exclusively in this country, and used without much understanding of its value. This as a rule is exaggerated; as a matter of scientific fact it has very little value[7]." [8]

Variations in Zinc Coatings

Having thus considered the present status of the Preece test the author wishes to present some new data and considerations which he believes are pertinent.

One highly important factor has been barely touched upon by previous authors, namely, the variation in composition among various zinc coatings of the same type. It is a well known fact that a hot galvanized coating consists of several layers. Theoretical considerations based on the equilibrium diagram of the Fe-Zn system[9] show that the following layers may occur in the order named. On the outside a layer of zinc saturated with iron in solid solution (less than 0.02 per cent Fe). Beneath this is a relatively thick layer of a constituent containing from 7.5 to 10.9 per cent Fe. This constituent may be considered to be $FeZn_7$ holding varying amounts of Zn in solid solution. For convenience the designation of $FeZn_7$ will be employed hereafter. Next comes a thin layer of an iron-zinc alloy corresponding in composition to the definite compound $FeZn_3$. Finally comes the surface layer of the iron or steel base which may hold some zinc in solid solution This phase if present would shade gradually into the iron and would not appear as a layer delimited by a sharp boundary.

Microscopic examination discloses a structure fully in accord with these considerations. See illustration. It should be noted, however, that the zinc layer may be contaminated by crystals of $FeZn_7$ of which the dross on the bottom of the galvanizing pan is composed. Moreover, the $FeZn_3$ layer may be too thin to detect even at high magnifications. The zinc layer may be

Arrangement of Zinc and Zinc-Iron Layers on Steel Base

entirely removed by the "wiping" of the wire or sheet as it emerges from the bath or may be converted entirely to $FeZn_3$ and $FeZn_7$ by subsequent annealing.

Sherardized coatings exhibit a heterogeneous structure containing in some cases very little if any pure zinc and always consisting mainly of the two iron-zinc alloys.

Electrogalvanized coatings of course consist of a single layer of pure zinc.

Late Tests on Wire Show Structure is a Factor

As would be expected, the chemical behavior of these various constituents in the Preece test or any other test is different. A careful series of tests to demonstrate the magnitude of these variations has been carried out in this laboratory. The following description of these tests and the graphic summary show the rate at which the two thickest layers, the zinc and $FeZn_7$ layer, are dissolved or replaced by immersion in the copper sulphate solution used in the Preece test.

In the course of an extensive investigation of galvanizing it was found that the number of one-minute copper sulphate dips which a coating withstands does not vary directly with the weight or thickness of the coating. It was surmised, correctly, as subsequent work proved) that the number of dips is a function of structure as well as weight of coating because of the difference in chemical behavior of the various layers referred to above.

To demonstrate this, the rate of removal of zinc coatings of various types by immersion in the Preece solution was determined by A. C. Simmons of this laboratory. The following wires were used in these tests. Wires 2 to 5 inclusive were purchased in the open market:

The Six Wires Used

1. Pure zinc wire.
2. Tight wiped No. 9 commercial galvanized wire having a coating consisting almost entirely of $FeZn_7$.
3. No. 12 wire of the same character.
4. No. 12 commercial wire having a coating of the same character but produced by a different process. (In this case the wire was not wiped to remove the outer pure zinc layer of the coating but was heat treated to completely convert this layer to $FeZn_7$.
5. No. 12 galvanized wire having a very thin $FeZn_7$ layer and a very thick outer layer of pure zinc.
6. No. 12 galvanized wire from the same coil as 5 but heat treated at 350 deg. C. for 1½ hours to increase the thickness of the $FeZn_7$ layer by diffusion of iron into the zinc layer.

To eliminate the effect of other variables in comparing 5 and 6, the samples were taken as follows: A 12-ft. length of wire was cut into twelve 1-ft. lengths. Alternate pieces were taken for heat treatment for 6 and the remaining wires used for 5. In testing, after discarding an inch from each end of the wire of the heat treated wires both the No. 5 and No. 6 samples were cut in two. One-half of each sample was stripped with hydrochloric acid and the other half tested by the Preece method.

The heat-treated samples were weighed before and after treatment to observe the effect of heat treatment on the weight of coating. The heat treatment was carried out in a tube furnace packed with a mixture of zinc dust and zinc oxide to prevent volatilization of the coating. This was quite effective, though some loss of zinc from the wire occurred.

Many other heat-treating experiments have been carried out in connection with this work, with similar results. The time and temperature used in this particular set of tests were selected as giving typical results.[9]

Varying Weights Removed Per Dip

The results are tabulated below and are plotted in the accompanying graph. The figures are the average of six samples in each case. The $CuSO_4$ solution was carefully prepared according to the standard method.

It is evident from the results of these tests that the rate of replacement in the copper sulphate solution is much lower for the alloy layers (considered together) than for the pure zinc layer. This is strongly indicated by a comparison of the rate of replacement for wires 2, 3 and 4, which have a coating consisting entirely of alloy layer, with the rate for wire 5, which has a coating composed largely of pure zinc layer. The higher rate of replacement of pure zinc is confirmed by examination of pure zinc wire No. 1. The pronounced reduction in rate during the final dip, when the alloy layers have been exposed, for wires 5 and 6 also points in this direction, though a small part of the reduction noted here may be due to the fact that the remaining coating is entirely removed over a small proportion of the total area before the expiration of the one minute immersion.

Marked Effect of Change in Structure

The most striking demonstration of the effect of a change of structure is to be found in a comparison of wires 5 and 6 which are identical in every respect ex-

[6] Op. cit., p. 115.

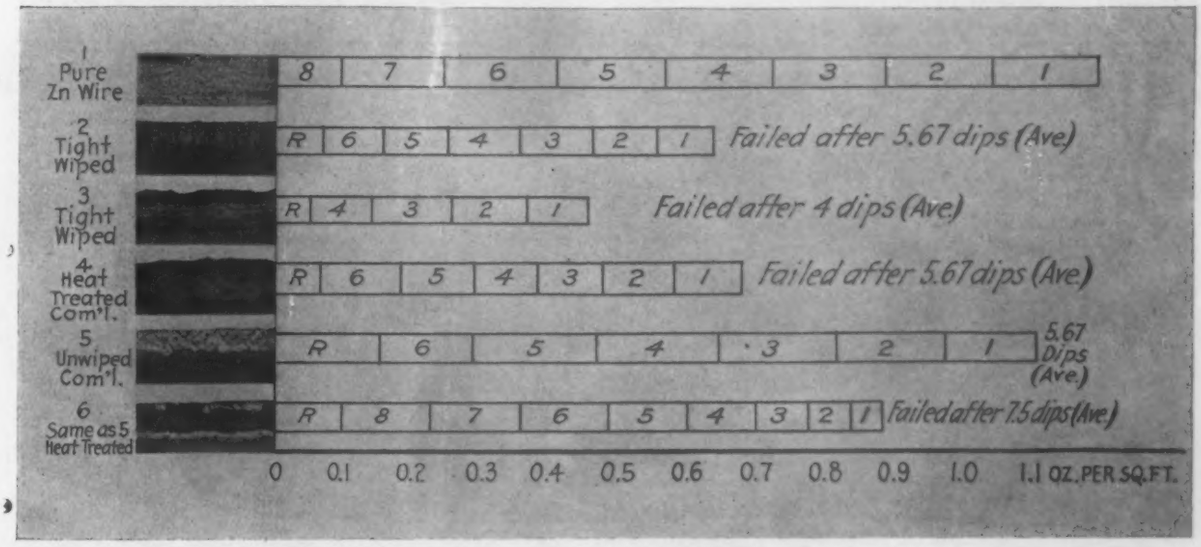
[7] The Preece test has been condemned, on account of its irregularities, by a committee of the American Society for Testing Materials. See Proc. Am. Soc. Test. Mat., 1911, vol. XI, p. 100, and ibid., 1917, Part I., p. 144.

[8] The Constitution of Some Binary Zinc Base Alloys W. M. Peirce, Trans. A. I. M. E., February, 1922.

[9] For the information of any one who may care to experiment along these lines it should be stated that the time and temperature necessary to produce a given result vary greatly with the nature of the steel base.

cept for the heat treatment which has changed the thickness and character of the alloy layer The increase in the number of dips before failure for the heat treated wire is striking, though by no means exceptional in our experiments. It may occur to the reader that the extra dips before failure are due to more uniform distribution of the zinc due to the heat treatment. Careful examination of the wires during the Preece test showed clearly that the samples in each case were very uniformly coated.

In some of our heat treating experiments another factor which seriously affects the Preece test was observed. Samples which became slightly oxidized on the surface lost as little as 0.034 oz. per sq. ft. during the first one minute dip due to the low rate of attack on the zinc oxide by the neutral copper sulphate solution. This, of course, resulted in a greater number of dips before failure. Sections of the same samples showed no change in the weight of coating as determined by stripping with acid.


1 Pure Zn Wire
2 Tight Wiped
3 Tight Wiped
4 Heat Treated Com'l.
5 Unwiped Com'l.
6 Same as 5 Heat Treated
8 7 6 5 4 3 2 1
R 6 5 4 3 2 1
Failed after 5.67 dips (Ave)
R 4 3 2 1
Failed after 4 dips (Ave)
R 6 5 4 3 2 1
Failed after 5.67 dips (Ave)
R 6 5 4 3 2 1
5.67 Dips (Ave.)
R 8 7 6 5 4 3 2 1
Failed after 7.5 dips (Ave)
0 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1.0 1.1 OZ. PER SQ. FT.

Key: Total Length of Bar=Weight of Coating. Each section=weight of coating removed during dip indicated. Section R=weight of coating not removed before failure

Weight removed in oz. per sq. ft. by successive 1-min. dips in $CuSO_4$

	1 Pure Zinc Wire	2 Tight Wiped Galv. Wire No. 9	3 Tight Wiped Galv. Wire No. 12	4 Heat-Treated Galv. Wire No. 12	5 Unwiped Galv. Wire No. 12	6 Same as 5 Heat-Treated
1st dip	0.093	0.090	0.091	0.117	0.137	0.132
2nd dip	0.152	0.097	0.118	0.108	0.180	0.131
3rd dip	0.165	0.103	0.110	0.092	0.178	0.128
4th dip	0.159	0.108	0.091	0.096	0.175	0.113
5th dip	0.159	0.095	....	0.103	0.157	0.099
6th dip	0.165	0.084	....	0.102	0.132	0.078
7th dip	0.155	....	....	....	....	0.063
8th dip	0.157	....	....	....	....	0.045
Total wt. removed in Preece test	1.205	0.577	0.410	0.618	0.959	0.789
Total wt. of coating as determined by stripping ...		0.640	0.458	0.683	1.109	0.885
Wt. removed per dip in Preece test	0.151	0.101	0.103	0.109	0.169	0.105
Ave. No. of dips to failure ...		5.67	4	5.67	5.67	7 5

Results Not Comparable

It is clear from these tests that the Preece test does not give comparable determinations of the weights of coating on galvanized coatings having dissimilar surfaces or structures.

The point might be raised that the rate of solution in copper suphate may bear a relation to the rate of solution under atmospheric agencies. How fortuitous such a relation would be if it existed is evident from the following tests. Two samples of rolled zinc, one 99.95 per cent pure and the other showing no lines except zinc in the spectroscope were found to have the same rate of replacement in copper sulphate, yet the spectroscopically pure zinc dissolved at only one-fortieth of the rate of the high grade zinc in 10 per cent hydrochloric acid. Thus there frequently is no parallelism between the effects of different corroding agents on a given set of materials.

Conclusion

The conclusions to be drawn are quite obvious.

1. The Preece test cannot possibly serve as a test for the weight of coating, though it may have some value for indicating the uniformity of the coating.

2. The Preece test does not give comparable determinations of the weights of coating on galvanized coatings having dissimilar surfaces or structures.

3. No practical comparison has shown any relation between the resistance of a coating to actual weathering and resistance to replacement by copper sulphate. Neither is there any similarity between the two conditions which would suggest such a relation.

4. Unless a fixed relation should be demonstrated between the results of the Preece test and life under atmosphric exposure, the stripping and weighing test to determine the weight of coating must be regarded as the most reliable indication of the quality of zinc coatings.

For effectively removing fuel oil sediment from tank cars, storage tanks in ships, industrial plants and similar places, the International Chemical Co., Philadelphia, has worked out several processes. By one method the tank is immediately boiled out with a chemical solution, with no preliminary or after steaming, nor manual labor to clean up afterward with gasoline. In some very large tanks special methods of procedure have been devised. For example, instead of filling the tank with solution, the chemical is sprayed or pumped over its entire interior.

Hope has revived that the Jones & Laughlin Steel Corporation will improve the property it purchased two years ago at Hammond, Ind., inasmuch as the title to the land has finally been cleared. The property lies entirely between Calumet and Columbia Avenues on the north side of Hammond.

The annual convention of the National Sheet Metalware Association will be held Sept. 9 and 10 at the Hotel Statler, Buffalo.

Large Overhead Crane Installation

Sixteen cranes including two of 250 tons capacity for handling locomotives comprise the crane equipment recently built for two new shops of a large Eastern railroad by the Niles-Bement-Pond Co., 111 Broadway, New York.

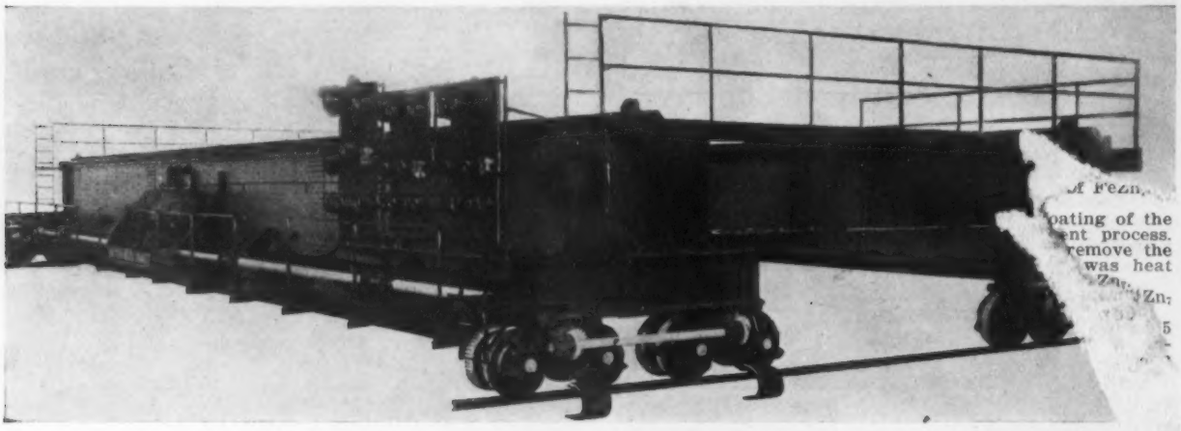
Eleven of the cranes are of 15-ton capacity. Of these nine have a span of 77½ ft., one 79 ft. 9 in. and one 97 ft. 10 in. There is also a 50-ton unit with a 10-ton auxiliary hoist and 79 ft. 9 in. span; a 60-ton crane with a 10-ton auxiliary hoist, 90 ft. 9 in. span, and a similar 60-ton unit with 103 ft. 3 in. span.

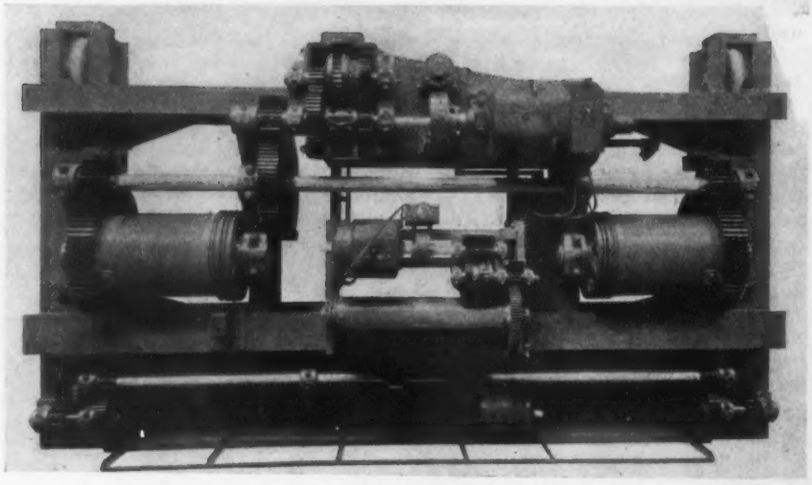
The 250-ton cranes for lifting locomotives are of 80 ft. 11 in. span and are of double trolley four-point suspension type, each trolley having a 10-ton auxilary hoist in addition to the main hoists which are of 125-ton capacity each, normal working load. Seven motors are employed as follows: Two main-hoist motors of 110 hp. capacity, two auxiliary-hoist motors and one trolley-motor, each of which is of 33 hp. capacity. The bridge motor is of 200 hp.

The weight of the 250-ton cranes is approximately 390,000 lb. or 195 tons each. When handling a 250-ton load the speed of the main hoist is 8 ft. per min., the speed of each auxiliary hoist being 30 ft. per min. The trolley travels at the rate of 80 ft. per min., and the bridge at 200 ft. per min. Magnetic control is provided on the main hoist and bridge travel. The arrangement of the switchboard and instruments may be noted from the accompanying general view of the girders and bridge drive.

The bridge travels on 16 wheels, eight at each end of the crane. The bridge trucks are steel castings of the equalizing type, the truck wheel axles revolving in M C B-bearings. The bridge drive cross shaft operates eight truck wheels, four at each end of the crane, which are connected by heavy shafts and miter gears, shielded by plate steel covers. In the bridge motor drive assembly, safety flange couplings on the cross shaft, convenient horizontal position of the motor, welded steel cases inclosing gears and the equalized power foot brake, band type, are stressed by the builder.

In the trolleys, a plan view of which with gear cases removed is also shown herewith, the elimination of overhung gears and accessibility of parts are features, as well as the lubrication arrangements for the double-disk type mechanical load brakes and the intermediate gears. Each self-contained unit revolves in an oil bath in addition to the internal oiling system, and graphite ring lining of the bronze friction plates and bushings in this unit. In this manner three independent lubricating systems are provided for this vital part of the crane mechanism, assuring, it is claimed long life and absence of trouble and repairs. The trolley platform is roomy and is provided with a handrail. The auxiliary hoist mechanism and the hoist limit switch, which is of the Acme type, are conveniently located. A feature emphasized is the construction of the trolley frame which is of riveted steel box section, with fixed axle truck wheel bearings. The truck wheels are fitted with long bronze bushings, eliminating shimming up or adjustment of parts to compensate for wear. The wear is said to be distributed to all parts, and the bushings claimed to last as long as the truck wheel.





Overhead Traveling Crane of 250-Ton Capacity for Handling Locomotives. The span is 80 ft. 11 in. There are two trolleys, each of which has a 10-ton auxiliary hoist, in addition to the 125-ton main hoist. Accessibility of parts, elimination of overhung gears, provision for lubrication and riveted steel box-section frame are features of trolleys, a plan view of which is shown at right with gear cases removed

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Freight traffic during the first five months in 1924 was nearly 8 per cent below that for the corresponding period last year when freight business on the railroads was the greatest for that period of the year in history, according to tabulations made by the Bureau of Railway Economics. In the eastern district there was a decrease of 10.3 per cent, in the southern district a decrease of 6.4 per cent and in the western district a decrease of 4.8 per cent.

To Reduce Idleness in Industries

Secretary Hoover Supports Suggestions of Committee in Regard to Preventable Seasonable Unemployment—Urges Lengthening of Building Season

WASHINGTON, July 22.—The need of eliminating the wastes of seasonal idleness has been brought forcibly to the attention of the construction industries and the public by reason of high labor costs and the failure of the building trades to attract young men into their ranks, Secretary of Commerce Hoover pointed out in a report made public yesterday, in which he urged lengthening of the building season, which, he said, will mean greater production from the men now engaged in the building trades and also go far to attract capable apprentices.

The outstanding purposes of the report are to mitigate seasonal ups and downs in the construction industries, to stabilize employment, and to lower costs. The report was made by the Committee on Seasonal Operation in the Construction Industries, which was appointed by Secretary Hoover as the outgrowth of the President's Conference on Unemployment called in 1921. The committee, of which Ernest T. Trigg, president of John Lucas & Co., is chairman, in its recommendation for elimination of waste caused by seasonal idleness through development of information as to probable future demands for labor and materials and the development of the habit of scheduling construction and repair work with reference to that demand. The committee found that custom rather than bad weather is responsible for building trades workers in most American cities working less than three-fourths of the year.

Balance Wheel of Industry

Secretary Hoover, in his foreword to the report, declared that construction is the balance wheel of American industry and that the value of yearly construction in the United States amounts to more than $5,000,000,000, while the number of employees engaged in construction, together with the workers of the material-producing industries, mounts into the millions.

The report of the committee declares that public works are especially well adapted for scheduling with reference to seasonal as well as cyclical conditions and that the efforts to engage long-range planning of a public works deserve the support of the public, legislators, and Administration officials. Attack is made by the committee on the wasteful customs of concentrating leases on a single leasing date which throws a heavy burden on tenants, landlords, storage warehouse companies and public utilities, and it is urged that this custom be modified.

As pointed out by Secretary Hoover, no solution is sought or suggested of Government regulation. The committee report says that the burden of idleness falls most heavily not on the producers and distributors but on the employees and the public. Construction costs, it declared, are high in part because of the seasonal hazard which affects construction processes, transportation and distribution. The art of construction, it is pointed out, has advanced to such a point that the effect of bad weather on building operations has been greatly reduced. The survey shows that there is today much less manual labor on the job than formerly; a greater proportion of the work is done in factories or by power machinery, which is less affected by the elements than hand labor.

Working in Cold Weather

Steel and concrete construction with certain safeguards, it is stated, can go forward at low temperatures and it is urged that methods of winter construction developed by leading contractors should now be greatly extended. Moreover, it is declared that winter work is being done in some cases more cheaply than summer work and in others at an increase in cost which is slight, compared with the advantages of holding the contractor's overhead expenses by keeping his organization together, the shorter time the owner's capital is tied up in the operation and the earlier date at which occupancy is made possible.

The committee expressed the opinion that a satisfactory solution of the single leasing date problem and the better knowledge of housing conditions can be obtained by means of housing surveys, and careful study of local shifts of population would be valuable to builders in planning their operations.

It is also pointed out that the banker can aid in stabilizing construction, since it is to him that the investor is apt to turn for advice. The committee suggested that there be a wider use of current information and a constant reaching out for further data regarding the characteristic trends in the construction industries.

"It is highly important in the banker's own interest as well as in the interest of his customers that he take account of the seasonal factor," said the report.

Importance of Public Work

Declaring that public works form about 25 per cent of all construction activities, varying in the last few years from three-fourths of a billion to over a billion dollars, the committee said they are therefore of great potential importance in stabilizing general construction activities. Out of 200 engineers in all parts of the country who replied to the committee's question, "Are public improvements rushed right along in the peaks of the annual building season?" 192 answered in the affirmative. The comment was frankly added that public works are undertaken without regard to private needs.

Employment Exchange

The committee called special attention to the report of the President's Conference relative to a permanent system of employment exchange and to the report by Sanford E. Thompson, relative to the practicability of continuous construction. The committee urged cooperation from all of the many groups including the public, architects, engineers, manufacturers, contractors, etc. It was declared that engineers with very intimate knowledge of the economies of off-season construction and probable future conditions can often convince their clients of the benefits to be derived from scheduling construction with due regard to seasonal conditions. It was suggested that inventive genius of engineers and manufacturers be called upon for help. The manufacturing industries, it was pointed out, are closely associated with the construction field. The difficulties of winter construction, it is explained, present an opportunity for study and the development of equipment to neutralize many of the obstacles which have limited the work performed during inclement periods. It is also stated that a number of building material producing industries have definitely adopted a program of increasing the offseason use of their products by means of advertising, furnishing advertising material to local dealers, and research in the further use of their products. In some cases, it is stated, they give seasonal discounts or datings. Advertising to apprise the public of dull periods in the building trades can be profitably utilized by labor, the report stated, in urging cooperation of labor and management to increase product and to eliminate waste. The committee also said that the machinery of national organizations is invaluable in the movement to level up building activity during the year.

SECRETARY HOOVER'S POSITION

Attempt to Aline Him with Metric System Not Justified

WASHINGTON, July 22.—Efforts of the World Metric Standardization Council to get support, either semi-officially or officially, from the Administration, gives every indication of failure. While Secretary of Commerce Herbert Hoover is in California, it has been rather plainly indicated here that he has no intention whatsoever of accepting the invitation of the council to assume a leading part in the meeting to be held at Lima, Peru, in November, in a Pan-American commercial conference at which it is intended to bring pressure upon the United States to adopt the metric system. As has been pointed out previously in THE IRON AGE, Secretary Hoover repeatedly has carefully avoided entangling himself and the Department of Commerce in the metric system issue, which long has been a point of sharp differences between its aggressive proponents and its opponents. It is evident that those urging the adoption by the United States Government of the metric system would feel that they had acquired great strength and prestige for their movement if they could have succeeded in getting Mr. Hoover either as an individual or an official to take up the gage of battle for them. But there can be no doubt that Mr. Hoover is thoroughly alive to the embarrassing position he would find himself in if he would accept the invitation that has been extended.

Never Favored Metric System

The fact that Mr. Hoover never has gone on record in favor of a metric system also would indicate that he is not in sympathy with the movement for its adoption by the United States. Friends of the Secretary resent the implication that has been given out that he is in favor of the metric system. The mere quotation of Mr. Hoover to the effect that he is "in favor of the introduction of standards to be agreed upon by all commercial nations," according to his friends, cannot possibly be interpreted to mean that he supports the idea of universal adoption of the metric system, or any other given system of weights and measures. It has been explained that Mr. Hoover, in making this statement, only has reiterated a fundamental principle that he long has entertained and has applied both as an engineer and as Secretary of Commerce. This merely is the principle of standardization without regard to the means of measurement or way to arrive at such a standardization. It is conceivable that Mr. Hoover feels that the idea of a universal system of weights and measures might carry a genuine appeal just as the idea of a universal language would do, but that as a practical matter it is extremely remote.

Must Have Proof

Secretary Hoover is understood to be of the opinion that the metric system or other so-called reforms of a similar nature can grow only by progressive proof of any advantage they may have. Certainly all their merit must be shown, it is maintained, not by legislative action, but rather by the gradual process of convincing one line of activity and then another. But many opponents of the metric system are convinced that this system has been on trial sufficiently long to prove conclusively that it has no advantage, but on the contrary is inferior so far as purposes of this nation are concerned to the English system, and would develop chaos and enormous expense in the industrial world if an attempt were made to compel its adoption. It is hoped by friends of Mr. Hoover that he will make public the reply he is expected to give to the letter addressed to him recently by Aubrey Drury, of the World Metric Standardization Council, in which the Secretary was urged to take part in the metric meeting in Lima.

POWER GENERATION

Progress in Efficiency and What It May Mean in Coal Savings

Progress in the thermal efficiency of large turbine electric generating units was discussed by E. W. Rice, Jr., of the General Electric Co., in a paper presented before the World Power Conference titled "New Fields for Research in Power Development."

After defining the term "thermal efficiency" as the ratio of the B.t.u.'s in the kw.-hrs. delivered by the generator to the bus, divided by the B.t.u.'s in the steam supplied to the turbine, less the B.t.u.'s returned to boilers in condensate, Mr. Rice sets forth the progress made in the efficiency of machines of 30,000 to 50,000 kw. from 1903-1923.

"Proposed new stations, using turbines of 100,000 kw. with 1200 lb. gage pressure, 725 deg. Fahr. steam temperature at throttle, are expected to obtain a thermal efficiency of 38 per cent in the turbine units. The utmost efficiencies attainable in the use of modern equipments are forecast in the accompanying table.

"Twenty-seven of the largest steam electric stations in the United States in 1923 sold 18,500,000,000 net kw.-hr. If this output had been generated entirely by the stations equipped with the latest commercial apparatus, the annual saving in coal consumption in the 27 plants would have been about five million tons. The stations produced about 40 per cent of the total output and, as the smaller stations were less economical, it is fair to assume that if the 1923 output had been supplied by the most economical units in the large stations, a possible saving of not less than 12,500,000 tons of coal would have been realized."

The promise in efficient power production of plants of the immediate future

Year	Apparatus	Gage Pressure per Sq. In.	Steam Temp. at Throttle Deg. Fahr.	B.t.u. per Kw.-hr.	Equiv. Lb. of Coal per Kw.-hr.	Thermal* Effic. of Plant. Per Cent
1924	New stations, 30,000 to 50,000-kw. turbines, steam extraction for feed water, but without reheating between stages	375	700	15,800	1.13	21.7
1924	New stations being erected, 35,000 to 60,000-kw., steam extraction and single reheating between turbine stages	550	725	14,500	1.04	23.6
....	Proposed new stations, 100,000 kw., single reheating between stages	550	725	14,200	1.01	24.1
....	Proposed new stations, 100,000 kw., two reheatings between stages	1,200	725	12,800	.91	26.6

*"Plant efficiency" takes account of all losses in boilers, flue and station operation.

Twenty years progress in efficiency of power plants

Year	Apparatus	Gage Pressure per Sq. In.	Steam Temp. at Throttle Deg. Fahr.	B.t.u. per Kw.-hr.	Thermal Eff. of Turbine Unit Per Cent
1903	5,000 kw. vertical turbines	175	378	23,500	14.5
1914	20,000 kw. horizontal turbines	200	588	14,500	23.6
1923	30,000 to 35,000 kw. horizontal turbines, average good practice	230	625	13,350	25.6
1923	Most efficient stations, 30,000 to 45,000-kw. turbines	230 to 250	625 to 650	12,500	27.2

Ordered to Abandon Pittsburgh Plus

Federal Trade Commission Decides Against United States Steel Corporation in Basing Point Controversy, One Member Dissenting—Appeal to Courts Expected

BY L. W. MOFFETT

WASHINGTON, July 22.—Directing the United States Steel Corporation to abandon the Pittsburgh plus practice of quoting steel prices, the Federal Trade Commission today issued a "cease and desist" order. It was entered by a four to one vote, Commissioner Nelson B. Gaskill dissenting. Those voting for the order were Chairman Huston Thompson and Commissioners John F. Nugent, Vernon W. VanFleet and John W. Hunt.

The order long has been predicted, the makeup of the commission indicating that an order would be issued, except that there was doubt as to what the attitude of Mr. VanFleet would be. It became known last week that the commission was about to announce its decision, but its early arrival after the arguments, which took place on June 23-24, was a mild surprise. It is assumed, however, that the minds of the commission already had been made up and that it anticipates that the Steel Corporation will appeal to the courts and desires to get the long-drawn out case finally decided. It is confidently believed that the Steel Corporation will, if necessary, take the case to the Supreme Court. In such an event, a final determination still seems a long ways off. Should the lower court decide in favor of the Steel Corporation by reversing the commission's order, then it is assumed the commission would appeal to the United States Supreme Court.

With the cease and desist order the commission issued an elaborate memorandum, incorporating its findings and reasons for them, and Commissioner Gaskill made a statement giving his reason for dissenting. In brief, he held that the commission does not have authority to prevent the quotation of prices on any basis the producer desires. His statement shows a rather searching study of the issue and declares that the Steel Corporation does not sell at the Pittsburgh base price, but quotes prices at Pittsburgh base plus freight to the point of consumption.

The majority held that, as charged, the Pittsburgh plus constitutes unfair competition in violation of the

Effects of Abandonment of Pittsburgh Plus System as Claimed by the Commission

Would build up all steel producing and consuming sections outside of Pittsburgh.

Return to the Western and Southern steel users the natural advantages of their location.

Decentralize the steel producing industry.

Eliminate useless cross hauls of steel by the roads which now exist under the plus system.

Eliminate the discriminatory prices charged by the steel producers to the consumers of the same mill.

Force price competition among the steel producers.

Save the farmers of the 11 Middle Western States alone $30,000,000 annually.

Eliminate excessive overhead cost which Western manufacturers suffer because of Pittsburgh plus.

Eliminate the necessity of the use by Eastern manufacturers of other commodities than steel.

Restore many Western plants which have been destroyed by the Pittsburgh plus system.

Eliminate the excessive price paid by the public for steel at all points outside of Pittsburgh, such as Chicago, Birmingham, Duluth.

Eliminate the price concealment of the discriminatory prices charged among the various customers of the Steel Corporation and force steel producers to disclose exactly how much they charge for steel and how much for actual freight.

Eliminate the unnatural advantage of Steel Corporation subsidiaries.

Eliminate the fixed Pittsburgh plus prices among the sheet manufacturers.

Eliminate the Pittsburgh plus prices in the South and force Southern mills to sell all their products f.o.b. mill.

Federal Trade Commission act and price discrimination in violation of the Clayton act. It suggests that if the Steel Corporation abandons the Pittsburgh plus its competitors will be forced to do likewise. The order calls for the establishment of f.o.b. mill prices, and the Steel Corporation is required to report within 60 days what it is doing to comply. The majority opinion says:

Opinion of Majority of Commission

"As to the Pittsburgh plus system, the commission finds that (a) it is contrary to the public interest; (b) it is not based on the laws of supply and demand; (c) it is a price-fixing scheme succeeding the old steel pools, Gary dinners, etc.; (d) it is made possible by the dominant position occupied in the steel industry by the United States Steel Corporation; (e) it substantially lessens and eliminates competition; (f) it destroys competitors; (g) it is price discrimination not made in good faith to meet competition; (h) it is an unfair method of competition; (i) it retards business in all steel centers except Pittsburgh; (j) it adds unnecessary millions of dollars annually to the cost of steel products, and specifically adds $30,000,000 to the cost of steel products paid by farmers in eleven Western States; and (k) it increases prices."

The Cease and Desist Order

The text of the order reads that the corporation and subsidiaries cease and desist:

1. From quoting for sale or selling in the course of interstate commerce their rolled steel products known as plates, bars, structural shapes, sheets, tin plate, wire and wire products at Pittsburgh plus prices.

2. From quoting for sale or selling in the course of interstate commerce their said rolled steel products upon any other basing point than that where the products are manufactured or from which they are shipped.

3. From selling or contracting for the sale of or invoicing such steel products in the course of interstate commerce without clearly and distinctly indicating in such sales, or upon such contracts or invoices, how much is charged for such steel products f.o.b. the producing or shipping point, and how much is charged for the actual transportation of said products if any, from such producing or shipping point to destination.

4. From discriminating in the course of interstate commerce, either directly, or indirectly, in price between different purchasers of their rolled steel products known as plates, bars, structural shapes, sheets, tin plate, wire and wire products sold for use, consumption or resale within the United States or any Territory thereof of the District of Columbia or any insular possession or other place under the jurisdiction of the United States, where the effect of such discrimination may be to substantially lessen competition in any line of interstate commerce; including competition among the steel producers, or steel users, or both; provided, however, that nothing herein contained shall prevent discrimination in price between purchasers of said products on account of differences in the grade, quality or quantity of the commodity sold, or that makes only due allowance for difference in the cost of selling or transportation, or discrimination in price in the same or different communities made in good faith to meet competition. The use by respondents in the course of such interstate commerce of the system of Pittsburgh plus prices for their said steel products, manufactured at and shipped from points outside of Pittsburgh—which prices are their f.o.b. Pittsburgh prices plus amounts equivalent to what the railroad freight charges on such products would be from Pittsburgh to each different destination if such products were actually shipped from Pittsburgh—shall be deemed to constitute a violation of their order. The use by respondents in the course of such interstate commerce of any system similar to that of the Pittsburgh plus system shall likewise be deemed to constitute a violation of this order. The practice by respondents of selling or contracting for the sale of said products in the course of interstate commerce upon any other basing point than that where the products are manufactured or from which they are shipped, shall be deemed to constitute a violation of this order.

Predicted Results of Order

The majority, after stating freight rates on steel to cities in the Middle West, say:

"Based upon the findings of the commission the effect of the order for the abandonment of the Pittsburgh plus system may be summarized as follows: (a) It will build up all steel producing and consuming sections outside of Pittsburgh, which are now held back by that system. (b) Return to the Western and Southern steel users the natural advantage of the location which is taken away from them by the system. It was found that the plus system permitted the Pittsburgh competitors of the Western steel users to share the Western territory, but prevented the Western steel users from sharing the Pittsburgh territory and prevented the Western steel users for the most part from even competing east of their plants. The elimination of the system gives the Chicago steel user the same advantage in his own territory which the Pittsburgh steel users would have in the Pittsburgh territory. (c) Decentralize the steel producing industry—decentralize the other industries which use steel in the manufacture of their products. (d) Eliminate useless cross hauls by the roads of steel which now exist under the plus system, thus effecting a great saving to the public. (e) Eliminate the discriminatory prices charged by the steel producers to the consumers of the same mill. (f) Enforce price competition among the steel producers. (g) Save the farmers of the 11 Middle Western States alone $30,000,000 annually. (h) Eliminate the excessive overhead cost per unit which Western manufacturers suffer because of the various restrictions on their business due to the Pittsburgh plus system. (i) Eliminate the necessity of the use by Eastern manufacturers of other commodities than steel in the manufacture of their products for shipment eastward. (j) Restore many Western plants which have been destroyed by the Pittsburgh plus system. (k) Eliminate the excessive prices paid by the public for steel at all points outside of Pittsburgh, such as Chicago, Birmingham, Duluth and all other points. Under the plus system Chicago consumers pay $13.80 per ton more than Pittsburgh consumers based upon the cost of producing steel at the two respective centers. The saving to the public should amount to a great many million dollars annually. (l) Eliminate the price concealment of the discriminatory prices charged among the various customers of the Steel Corporation under the plus system and force the steel producers to disclose exactly how much they charge for steel and how much for actual freight and prevent them from charging any other freight than actual freight on their steel. (m) Eliminate the unnatural advantage of the American Bridge Co., American Steel & Wire Co. and American Sheet & Tin Plate Co. when competing with their own or the Steel Corporation's customers, who are forced to pay Pittsburgh plus prices for their steel. (n) Eliminate the fixed Pittsburgh plus prices among the sheet manufacturers in the National Association of Sheet and Tin Plate Manufacturers with whom the respondent, American Sheet & Tin Plate Co., cooperates in price fixing activities. (o) Eliminate the Pittsburgh plus prices in the South and force the Southern mills to sell all their products f.o.b. the mill and thus force a lower mill price at Birmingham.

Would Not Disturb Business

"While the elimination of the Pittsburgh plus system will revolutionize marketing methods in the steel industry, there is no reason for any fear that business conditions will be unduly disturbed thereby. The respondents eliminated Pittsburgh plus on plates, bars and shapes in the Chicago district in 1921 at a time when price competition had been started in the East, and they have not returned to the system there as to those particular products.

"The respondent eliminated Pittsburgh plus on plates, shapes and bars in 1908 in the Birmingham sec-

tion, because the consumers refused to pay it, and they have not returned to the system in the immediate area around Birmingham on those products. Pittsburgh plus was abandoned during the war and was put back before the war closed upon the advice of Judge Gary. In none of these cases was a disturbance to business noted. Judge Gary suggested during the war that a basing point be established on pig iron, but his suggestion was not carried out. Pig iron is sold f.o.b. the producing mill and not on the Pittsburgh plus system, though it is the basic commodity used in the production of steel and is produced in substantially the same percentages in the various States as steel is.

"No other industries employ the Pittsburgh plus system and all other industries are able to get along without it."

Findings of Fact

Findings of facts made by the commission based upon the evidence introduced in the case may be summarized as follows: It was held to be an unfair method of competition for the steel producers to charge discriminatory prices for their steel, in that it prevented the steel users against whom the discriminations operated to compete with those in whose favor it operated.

The very existence of Pittsburgh plus prices, the commission found, proved there was no price competition among the steel producers.

The commission held that if the steel producers ceased to produce steel at Pittsburgh, the Pittsburgh plus system could nevertheless continue; that Pittsburgh plus prices were charged utterly regardless of supply and demand; that the only things which eliminated the Pittsburgh plus system for short intervals of steel history was price competition.

No merit was found in respondents' original contention that the free operation of supply and demand was responsible for Pittsburgh plus prices, but it was held, on the contrary, that the Pittsburgh plus system restrained the free operation of supply and demand.

The commission held it was a particularly unfair method of competition for the respondents to charge their customers Pittsburgh plus prices, where these customers actually competed with other respondent companies, such as the American Bridge Co., the American Steel & Wire Co. and the American Sheet & Tin Plate Co.

The commission found that the Pittsburgh plus system as a systematic device did not originate until 1903, which was after the formation of the Steel Corporation. It originated at that time as the basis for the price fixing agreements of the pools and trade meetings. After that, it was used as the basis for the uniform Pittsburgh plus prices developed out of the Gary dinners. After the Gary dinners were ended, it took the place of the pools, price fixing trade meetings and Gary dinners, and has been very effective ever since as a price fixing and price maintenance device.

It was found that before the Pittsburgh plus system was used the steel mills sold steel f.o.b. their respective mills, and that Pittsburgh plus prices always originated by agreements to fix prices. The commission also found that prices made as the Pittsburgh plus prices are made are not prices made in good faith to meet competition.

The decision, continuing, says:

Discrimination Among Customers

"The corporation, in selling its products from mills outside of Pittsburgh at the Pittsburgh plus prices, discriminates among the customers of the *same mill*. In the case of two steel users buying steel from the same mill outside of Pittsburgh, that steel user whose plant has a less freight rate from Pittsburgh secures a less price from the corporation than his competitor whose freight rate from Pittsburgh is greater. In other words, the actual freight rate from the producing mill to the customer's plant *does not* determine the difference between the delivered price paid by customers buying steel from the same mill.

"The Pittsburgh plus price system substantially lessens competition among the users of steel, and as a result of this system customers of the Steel Corporation against whom the discrimination operates are very seriously handicapped. Chicago fabricators of steel buildings and bridges, for instance, are unable to compete east of Chicago against the Pittsburgh fabricators on straight competitive structural steel work. Pittsburgh fabricators, on the other hand, compete on an equality in Chicago with the Chicago fabricators because the freight paid by the Pittsburgh fabricator on his finished product from Pittsburgh to Chicago is offset by the higher price paid by the Chicago fabricator for his steel bought in Chicago under the plus system. Nowhere in the United States does the Chicago fabricator have an advantage over the Pittsburgh fabricator, and it is in a very limited territory that he can compete on an equality. With the Pittsburgh plus system eliminated, the Chicago fabricator's territory would extend half way to Pittsburgh.

"The Pittsburgh fabricator, however, under the plus system, competes in Chicago on an equality with the Chicago fabricator. At Pittsburgh the Pittsburgh fabricator, under the plus system, has an advantage over the Chicago fabricator to the extent of $15.20 per ton. The effects of the plus system are thus seen distinctly when it is remembered that the Pittsburgh fabricator is at no disadvantage when competing in Chicago, while the Chicago fabricator, under the system, is under a prohibitory disadvantage if he attempts to compete at Pittsburgh. This advantage under the plus system rests with the Pittsburgh fabricator notwithstanding the fact that the cost of producing steel at the corporation's Chicago mills is much lower than at its Pittsburgh mills.

"Pittsburgh plus means an added cost of $15.30 to the Birmingham wire user; to the Duluth steel user it means $13.20 per ton, and the Chicago steel user pays $7.60 per ton—these prices represent the imaginary freight rate to these points which the steel user has to pay, but which does not go for freight. As Judge E. H. Gary, chairman of the board of directors of the United States Steel Corporation, testified before the commission, freight rates ordinarily determine a steel user's market. But, as the evidence shows, the Pittsburgh plus system necessarily greatly restricts and frequently extinguishes the market which freight rates would ordinarily determine.

"With the imaginary freight charge from Pittsburgh eliminated, the Chicago drop forging manufacturer would have an advantage as against Pittsburgh competitor in territory extending to a lone running a little east of Detroit and through Toledo, but with Pittsburgh plus prices in operation there is no market where the Chicago forging manufacturer has an advantage or can even compete upon an equality with his Pittsburgh competitor. To the freight rates on his finished products from Chicago to Detroit, Pittsburgh plus adds to the Chicago forging manufacturer 169 per cent; when he goes to Indianapolis, the plus system adds 170 per cent, when he goes to Rockford, Ill., Pittsburgh plus adds 209 per cent.

In Periods of Depression

"The effect of Pittsburgh plus prices is greatly aggravated in depressed business periods when manufacturers need additional business the most. In such periods the Pittsburgh and other Eastern manufacturers of steel products go into the Chicago territory and take business at a very small profit, sometimes below profit, in order to keep their plants going and to spread their overhead charges over a large production. During these times the Chicago manufacturer likewise needs business to keep plants going to keep down overhead charges, but their needs are subservient to the needs of their Eastern competitors. These Eastern competitors divide and take away much of the Western business, while the Western manufacturers are left helpless without a reciprocal power to invade the East, all because of the Pittsburgh plus system.

"Fabricators generally in the West, the findings state, have shown that their plants have not expanded materially for a number of years. Each time the freight rate increased the Pittsburgh plus discrimination likewise increased. In other words, every time the freight rates increase the steel users in the West buying from

Western steel mills must pay more for their steel, while the Pittsburgh steel users do not have to pay more.

"The discriminatory Pittsburgh plus prices have very substantially lessened and at times destroyed the competition of steel users located at a great number of points, including dozens of cities in the States of Illinois, Wisconsin and Minnesota. A large number of steel users in the States of Iowa, Nebraska, Missouri, and Indiana, and in the Southern States of Alabama, Georgia and Tennessee, were very seriously hampered because of the Pittsburgh plus system. A number of steel users were compelled to discontinue the manufacture of a variety of products made of steel because of the plus system, and a large number of manufacturers testified that they will be ultimately driven out of business if Pittsburgh plus prices continue.

"Testimony of some 125 witnesses before the commission, showing a substantial lessening or destruction of their competition in interstate commerce due to Pittsburgh plus prices, remains undisputed in the record.

Eliminating Competition

"As a means of restraining and eliminating price competition, the Pittsburgh plus practice was found to be very effective. If price competition occurred to a substantial extent in the steel industry, Pittsburgh plus prices disappeared. Every time the Pittsburgh plus prices appeared, price competition had accordingly ceased. If the corporation and its subsidiaries abandoned their Pittsburgh plus prices, their competitors would have to do so likewise. The corporation's prices are generally followed by its competitors. If the corporation quoted and sold its products f.o.b. the mill, its competitors could not sell their products according to the Pittsburgh plus practice.

"In addition the commission found that the steel producing respondents and their competitors employed uniform contract provisions, uniform extras and differentials and that the sheet manufacturers, particularly including the sheet manufacturers, subsidiaries of the Steel Corporation, used the same freight rate books, the same tolerances, the same sheet bar weight books and used the Pittsburgh plus system in their price fixing activities. The continuous use of any one or all of these adjuncts in price fixing is entirely consistent with the uniform delivered prices which are sought to be and are actually attained thereby. It is necessary to use these adjuncts to reach absolutely uniform Pittsburgh plus prices by all the steel producers and in using them the desired results are obtained. Indeed, the Pittsburgh plus system was adopted by the producers for the purpose of reaching absolutely uniform prices at any given point where, in the words of Judge Gary, 'It was deemed necessary for the orderly conduct of the business to have one basing price . . . so that every user of steel all over the country bought and sold his steel on a certain basis, knowing in advance that everyone else who bought steel had to pay exactly as he did, with the addition of the increased freight depending upon where he wanted to use the steel.' The evidence in the record fully proves that the wish to provide an absolutely uniform price at any given point by all the producers was and is made by the Pittsburgh plus system.

The Public Interest

"The commission finds that the corporation's discriminatory or Pittsburgh plus prices adversely affect the public interest. The cost of producing steel at the corporation's Chicago and Birmingham plants is approximately 20 per cent less than at its Pittsburgh plant. The cost at Birmingham is slightly less than at Chicago. There is a great surplus production in both the Chicago and Birmingham districts, yet the prices at which the corporation sells the steel at Chicago and Birmingham are very much greater than at Pittsburgh.

"What the public pays on account of the Pittsburgh plus may be illustrated by a few specific instances. First, in one Chicago building alone, the Federal Reserve Bank Building, the imaginary freight on the steel alone amounted to over $76,000 which went to one of the respondents, the Illinois Steel Co. In five years the Manitowoc Ship Building Co. paid the Illinois Steel Co. $140,000 as imaginary freight which the United States Shipping Board, and therefore the Federal Government, had to pay in the last analysis. Deere & Co., a farm implement manufacturer, pays $488,400 annually as imaginary freight while the farmers who purchase their implements may have to pay over double that amount or over $1,000,000 annually for Deere & Co.'s implements because of this imaginary freight item.

Paid by Farmers

"As the president of the American Farm Bureau Federation, reaching more than a million and a quarter farmers, testified, 'The double Pittsburgh plus imaginary freight thus paid by the farmers in only 11 Middle Western States amounted to around $30,000,000 annually.' The farmers in the other States would use even more steel than in the 11 States figured in this calculation. The Emerson-Brantingham Co., a farm implement manufacturing company, pays around $100,000 annually as Pittsburgh plus imaginary freight which means that its customers pay around $200,000 annually more than they would have to pay if the Chicago district mills eliminated the Pittsburgh plus. Pittsburgh plus resulted in an addition to the list price of J. I. Case Threshing Machine Co. in the year 1921 alone of $509,033, which amount the farmers would have been saved if Pittsburgh plus had not been charged.

"On all the public works of the United States, as well as on all the work done for private concerns, the public must eventually pay the exact prices which the Pittsburgh plus practice yields to the producers. Pittsburgh plus adds millions of dollars each year to the prices paid by steel users outside of Pittsburgh which, of course, must eventually be paid by the public.

"As testified to by three eminent economists called by attorneys for the commission, the Pittsburgh plus system inevitably raises prices to the public. This testimony was fully borne out by many actual instances in the steel industry. In many cases where the steel producers charged f.o.b. mill prices instead of Pittsburgh plus prices, the latter were higher than the former. As was likewise testified to by these three economists and as likewise borne out by actual experience in the steel industry, the Pittsburgh plus system retarded the steel producing development and steel consumption of every section of the United States except Pittsburgh. It abnormally increased the development of the Pittsburgh mills and accordingly restrained the development of the mills outside of Pittsburgh. The development of the Pittsburgh mills is abnormally increased because under the plus system the market of the Pittsburgh mills is the entire United States. The development of the mills outside of Pittsburgh is restrained because they are obliged to share their market with the Pittsburgh mills and cannot, without lowering their prices, invade other markets.

Handicap to Steel Users

"Steel consumption at points outside Pittsburgh is restrained by the plus system because of the handicap suffered by the steel users at such points as Chicago, Duluth, Birmingham and others. In other words, they must share their markets with their Pittsburgh competitors while they do not have the reciprocal privilege of sharing the Pittsburgh market, or, indeed, the markets which would be their own markets if Pittsburgh plus were eliminated. Furthermore, the added cost of steel to the steel users outside Pittsburgh lessens the extent to which steel is used generally. If free competition existed in the steel industry, the prices in the Chicago and Birmingham districts would fall to a level consonant with the lower cost of production at the points which they have failed to do under the plus system.

"The influence of the Pittsburgh plus system has already been felt beyond the steel industry. The Interstate Commerce Commission has refused the application of a railroad company to increase its freight rates in a decision in which that commission stated that to do so would automatically increase the price of steel because every time the railroad freight rates are increased from Pittsburgh the steel producers increase

their steel prices accordingly. (I. C. C. Docket 1837, Decided Sept. 29, 1923).

"The commission found that the Pittsburgh plus prices of the Steel Corporation are not made in good faith to meet competition. These prices were originally adopted as the basis for the price fixing activities of the Steel Corporation and its subsidiaries and are still used for the same purpose. It was and still is only necessary for the steel producers to use the same Pittsburgh prices as the basis for their prices covering their various rolled steel products in order to maintain uniform Pittsburgh plus discriminatory prices. The price at every locality in the United States automatically becomes the Pittsburgh price plus an amount which would equal the freight on the steel from Pittsburgh to destination if the steel were actually shipped from Pittsburgh. While the system was used as the basis for the agreed prices fixed by the original pools, trade meetings and Gary dinners, it was found later that such price fixing obviated the necessity of such pools, price fixing trade meetings and Gary dinners; so it finally succeeded these three plans and as such successor it still continues.

Competition Not Free

"The commission found that the Pittsburgh plus system itself is evidence that free competition does not exist. As the three economists testified, and as other evidence in the record clearly shows, price competition among the steel producers brings about f.o.b. mill prices. The lack of competition is evidenced when Pittsburgh plus prices are in effect. Price competition is evidenced by uniform f.o.b. mill base prices, uniform to all the customers of the same mill and uniform among the different producers in the market. Such prices, however, are not the corporation's Pittsburgh plus prices. Pittsburgh plus prices are not f.o.b. mill prices. They are prices f.o.b. Pittsburgh.

"The commission found that under the Pittsburgh plus system there is no free operation of the law of supply and demand. Under the system the natural territory of the Chicago mills is a small restricted territory which includes the city of Chicago and portions of a few Middle Western and Rocky Mountain States. The consumption of steel in the natural distributing territory except in Chicago is small. In this territory the Chicago mills receive their highest net returns under the plus system. They allow Pittsburgh and other Eastern mills to share this territory with them even though they produce much more than is necessary to supply the demand in it. They are consequently forced to, and they do, either curtail production or 'dump' their surplus material in territory where they do not get the highest net return.

"Under free competition the Chicago mills would not share this high net return territory with the Pittsburgh and other Eastern mills. They would keep this territory for themselves."

Order of Commission

The commission ordered that the respondents, within 60 days from and after the date of the service upon them of this order, shall file with the commission a report or reports in writing setting forth in detail the manner and form in which they are complying and have complied with the order to cease and desist hereinabove set forth.

It was further ordered, that the charges in the complaint herein as against the respondents, National Tube Co., Clairton Steel Co., Union Steel Co. and the Lorain Steel Co., be, and the same are, hereby dismissed.

The commission dismissed the complaint because of lack of evidence, it was stated today, against the National Tube Co., the Clairton Steel Co., the Union Steel Co. and the Lorain Steel Co., all subsidiaries of the Steel Corporation.

The order of the commission is proposed to become effective immediately from date of service upon the Steel Corporation which received the order today. The Steel Corporation, however, is allowed 60 days within which time to submit to the commission a report of the manner of compliance with the order or it may submit notice of appeal to courts. It is believed the latter will be done.

Dissenting Opinion of Commissioner Gaskill

The dissenting opinion of Commissioner Gaskill follows:

"I find myself unable to concur in the majority conclusion that the powers of the commission include a remedy for the practices complained of. The significance of the commission's decision is so important and the implications of the order are so extensive that a statement of the basis of my dissent seems to be justified.

"The United States Steel Corporation is a legal entity. It owns a number of manufacturing plants located in various parts of the United States at which it produces, among other steel products, those which are the subjects of the present inquiry, viz., plates, shapes and bars. The policy of the corporation is to sell plates, shapes and bars only on a delivered basis. These products irrespective of the place of manufacture, are valued as though they were at Pittsburgh, and this uniform valuation of the products of the separate plants constitutes the 'Pittsburgh base.'

"The corporation does not sell at the Pittsburgh base price. It quotes prices at Pittsburgh base plus freight to the point of consumption. This is 'Pittsburgh plus.' The actual selling price, however, involves another element. The mill from which delivery is made invoices the customer at Pittsburgh plus less the actual freight to the point of consumption. What is added to Pittsburgh base to make the selling price is not the actual transportation charge nor a theoretical freight charge from Pittsburgh to the place of consumption, but is the difference between them.

"Plates, shapes and bars are the raw materials of a subsequent industry. With them the fabricator commences. Through its subsidiaries the Steel Corporation is engaged on this plane also. The transfer of raw materials to these units of its organization is not governed by the requirements of Pittsburgh plus. These fabricating units start with the advantage over their rivals in the elimination of the freight rate from Pittsburgh to the point of fabrication in their favor. Their rivals accumulate an additional freight rate in any eastward movement of finished products, if the point of fabrication be west of Pittsburgh. The subsidiaries of the Steel Corporation have also the advantage in a Western movement of finished products in that a single long haul rate on the fabricated products is almost universally less than the sum of the two short haul rates required of competitors in bringing in raw materials on Pittsburgh plus and moving out finished products at the actual rate to the point of consumption.

"The argument is made that there are manifestations both in the field of steel production and its fabrication, which indicate the operation of other than competitive forces and that the impelling cause or the protective agency through which that cause operates, is Pittsburgh plus. It is contended that—

1. The United States Steel Corporation is the dominant factor in the steel industry of the United States and that through Pittsburgh plus.
2. Its subsidiary companies enjoy controlling advantages over their competitors in the matter of prime cost of raw materials and delivered cost of finished products.
3. The normal development of the steel industry in respect of location has been retarded and that industry unduly concentrated.
4. The development of a properly disseminated fabricating industry has been very seriously obstructed if not reduced to a permissive basis.
5. The uneven development of the steel industry and that of its fabrication works a grave hardship to many sections of the country.

(*Concluded on page* 236)

Capital Requirements for Manufacturing

Financial Showing of Thirteen Companies—How Money Needs Expand Faster Than Increase in Volume of Sales—Position of One-Man Company

BY W. A. LAYMAN

MANUFACTURING companies in the electrical business very naturally divide themselves as to size and capital requirements into three groups:

A. The very large companies with sales exceeding $25,000,000 annually, which I have designated below as Group A.

B. The intermediate companies the average of whose sales is within $10,000,000 a year, designated below as Group B.

C. The so-called "one man" companies doing business of less than $500,000 a year, designated below as Group C.

In Table No. 1 are set forth the capital requirements of 13 companies, three of which fall in Group A, five in Group B, and five in Group C. In order that the data given may represent a fair average distribution with reference to varying trade conditions, I have taken, where immediately available, balance sheets of the individual companies for both 1922 and 1923. Annual sales in each instance, irrespective of the size of the company, are taken as 100 per cent, and both total and distributed capital requirements are given in percentage of annual sales.

A careful study of this table discloses some exceedingly interesting facts, as follows:

1.—It will be seen that the capital requirements of the electrical manufacturing business, irrespective of the size of the business, are very large—much larger than generally supposed.

2.—The capital requirements of this business grow very rapidly with the size of the business.

3.—The annual turn-over of capital is at a very low rate, irrespective of the size of the business.

4.—To do a "one man" business requires 72c. of capital for each $1 of sales, even though these "one man" companies, generally speaking, occupy leased plant facilities.

5.—The investment in inventories, irrespective of the size of the company, is very large—approximating in all companies about one-third of the total invested capital.

6.—Because of the slow turn-over of inventory, the hazard of inventory losses from price variations due to trade fluctuations is very great.

7.—Plant investment grows very rapidly with the growth in size of the business.

It will be interesting to segregate out of Table 1 the distribution of capital of one conservatively capitalized company of each group. As the General Electric and Wagner Electric balance sheets are public information, I select their operating ratios as illustrating the conservative requirements of Groups A and B. For Group C, I select a company whose capital requirements are practically the minimum for conservatively financed "one man" companies, not naming this company, however, since its balance sheets are not given general publicity.

Table 2—Asset Items in Relation to Sales of Three Typical Companies

	General Electric Co. 1923	Wagner Electric Corporation 1923	Group C Company 1923
Annual sales	100	100	100
Plant and equipment	22	47	12.25
Cash and equivalent items	33	11	.2
Notes and accounts receivable	22	12	16.35
Inventories	31	36	25.36
Miscellaneous assets	30	3	6.67
Total assets	138	109	60.73
Capital required per dollar of sales	$1.38	$1.09	$0.607

From the above comparison of three typical companies, several things will be immediately observable, as follows:

A.—The "one man" company has little or no plant investment; carries little or no cash on hand; has a heavy investment in inventory and must figure on not less than sixty days average for accounts receivable.

B.—To move from the "one man" company class into the intermediate group, the small company must at once jump up very much in plant investment, must expand its cash balances in bank substantially, and also substantially increase its inventory investment.

*Table 1.—Distribution of Assets of Electrical Manufacturers in Percentage of Annual Sales**

	Company No.	Year	Annual Sales	Plant and Equip't	Cash and Equiv. Items	Notes and Accts. Rec.	Inventories	Misc. Assets	Total Assets	Capital Required per Dollar of Sales
Group A Three large companies whose total assets exceed $50,000,000 each.	1.	1922	100	33	43	19	44	38	177	$1.77
		1923	100	22	33	22	31	30	138	1.38
	2.	1922	100	40	6	24	55	17	142	1.42
	3.	1922	100	151	50	35	48	2	286	2.86
		1923	100	118	32	34	48	6	238	2.38
Average of Group A (1922 and 1923)				72.8	32.8	26.8	45.2	18.6		1.96
Group B Five intermediate sized companies the average of whose total assets is approximately $6,500,000 each.	4.	1922	**100	106	5	15	34		160	1.60
		1923	100	106	6	11	40	2	165	1.65
	5.	1922	100	108	3	31	47	7	196	1.96
		1923	100	72.49	3.25	24.69	49.46	7.31	157	1.57
	6.	1922	100	113	9	17	76	27	242	2.42
	7.	1922	100	44†	4	17	33	1	99	0.99
		1923	100	33	3	15	35	1	87	0.87
	8.	1922	100	64	6	15	48	4	137	1.37
		1923	100	47	11	12	36	3	109	1.09
Average of Group B (1922 and 1923)				77	5.58	17.5	44.2	6.53		1.50
Group C Five small companies (virtually "one man" companies) the total of whose assets does not exceed $275,000.	9.	1923	100	12.25‡	0.2	16.35	25.26	6.67	60.73	0.607
	10.	1923	100	22	3	12	9	7	53	.53
	11.	1923	100	16	2	11	28	4	61	.61
	12.	1923	100	36.22	3.05	15.20	27.9	3.25	85.62	.856
	13.	1923	100	51.04	2.19	13.87	21.48	8.03	96.61	.966
Average of Group C (1923)				27.50	2.08	13.68	22.33	5.79		.71
Average of Groups A, B and C (1922 and 1923)				62.89	11.82	18.95	38.74	9.68		1.41

*Taken from balance sheets published or available through credit agency channels.
**Annual sales estimated.
†About one-half of real estate and buildings leased.
‡Probably lease all real estate and buildings.

C.—For the intermediate man to go into the large class would call at once for very heavy additions to investment—particularly in working cash balances, notes and accounts receivable, and miscellaneous investment items.

There has been a very widespread lack of appreciation of the capital requirements of the electrical manufacturing business for inventory purposes alone. A tabulation for some of the leading companies will indicate clearly not only that 1922 and 1923 inventory requirements, as shown in Table 1, are large, but also that the average inventory requirements over a long period of time are uniformly large.

Table 3—Ratio of Inventory Investment to Sales

Name of Company	Period (No. of Yr.)	Av. Inventory Investment in Percentage of Annual Sales*
Westinghouse Elec. & Mfg. Co..	10	46.2
General Electric Co.....	11	40.7
Allis-Chalmers Mfg. Co.....	6	47.3
Century Electric Co.....	7	38.7
Emerson Electric Co.....	2	35
Wagner Electric Corporation...	12	38

*The abnormal years of 1919, 1920 and 1921 eliminated.

stockholders as furnishing the more or less permanently invested capital of the business.

Current liabilities may fairly be regarded as "other people's money" and it will be noted that "other people" supply the group A companies the necessary capital for handling 15.8 per cent of their annual sales; the group B companies 21.8 per cent; and the group C companies 18.7 per cent, and that the average of "other people's money" used by all of the companies is 19.2 per cent of the total annual business done. So, a very important phase of the capital requirements of the electrical manufacturing business is that not only is a very large amount of capital required, but, generally speaking, it is a practice of the business to depend upon other than stockholders for a very substantial part of this capital.

It will be particularly noted that there are only three companies out of the 13 above listed whose employment of "other people's money" is less than 10 per cent of the annual business done, while in a number of instances the percentage runs above 25. As in all businesses there is a tendency to "trim sails" at the end of the fiscal year for balance sheet window dressing pur-

W. A. LAYMAN

MR. LAYMAN, who is president of the Wagner Electric Corporation, St. Louis, and some years ago president of the National Metal Trades Association, recently had these two experiences: One was a visit from a manufacturer of electrical equipment who had declined a contract aggregating $2,000,000 of business per year "because he found it would require 70 cents of invested capital for each dollar of the business offered." The other was a visit from another electrical manufacturer who said that his "plant was operating substantially at full capacity without profit," and to improve this situation it was necessary to increase sales "since the capital investment to do this would not be large." The two interviews prompted questions in part as follows:

How is the capital sub-divided among the various assets of the business?

How do the capital requirements vary according to the size of the business?

How much of the capital required is supplied in the form of loans from banks, credit from merchandise suppliers and other sources than stock and bond holders?

Will a study of the actual operating figures of typical companies serve usefully in outlining policies with respect to when and how to grow?

The answers he contributed to the spring meeting of the Electric Power Club and are given here substantially in full.

A comparison of the inventory requirements for the years 1922 and 1923 with Table 3 will indicate clearly that some of the companies recognize in a very keen way the desirability of reducing their inventory investments to a lower level. But in some instances, inventories have continued down to date very high values.

It is a fair inference from all of the figures shown that it requires excellent management to hold inventories down below 45 per cent of the annual sales turnover for the group A companies; 40 per cent for the group B; and 30 per cent for the group C.

As a sidelight on the capital requirements of the electrical manufacturing business, it is very interesting to observe how much of the actual capital assets of the 13 typical companies considered in this investigation is supplied by the bankers and creditors of the several companies. Table 4 below sets out this information, again expressed in percentage of annual sales. In this table current liabilities only have been considered, bond holders being grouped with preferred and common

Table 4—Amount of Capital Represented in Accounts Payable, Bank Loans, etc.

Company	No.	Annual Sales	Bank Loans or Equiv., Per Cent Annual Sales	Accts. Pay., Per Cent of Annual Sales	Total Current Liabilities, Per Cent Annual Sales
A	1	100	None	5	15
	2	100	None	6.6	13.3
	3	100	None	4.3	19.2
Group A Average			0	5.3	15.8
B	4	100	26	0.8	26.8
	5	100	21.5	2.8	28.8
	6	100	28.5	6.7	44.0
	7	100	2.5	1	4.7
	8	100	None	2.1	4.6
Group B Average			15.7	2.7	21.8
C	9	100	5.9	19.3	26.6
	10	100	None	3.7	5.9
	11	100	None	4	15.8
	12	100	10.4	2.7	15.9
	13	100	15.7	11.6	29.4
Group C Average			6.4	8.3	18.7
Average for 13 companies			8.5	5.4	19.2

poses, it is fair to assume that during a considerable portion of the operating year the employment of "other people's capital" exceeds the figures above shown.

I should like to make the following very frank observations, based upon many years' experience in the electrical manufacturing business:

1. *There is a very large, highly trained personnel of engineering talent in this industry. Because of the engineering allurement which the business offers, there is the constant temptation for engineers to organize small electrical manufacturing companies. In the main, these small business ventures are undertaken without a fair comprehension of the capital requirements of the industry.*

In the early stages of such ventures, and particularly when trade conditions are good, it seems very easy to make a comfortable profit. As the business begins to expand, there is a gradual awakening to the fact that the capital requirements of the business grow at a substantially faster rate than the volume of sales. Soon the company passes beyond the "one man" stage and then begins to get into territory where the keenest and most careful kind of management is essential to success. As the business grows, the problems of financial organization constantly and seriously increase and in time the business reaches a point where the management, stockholders and bankers discover that the capital requirements are far beyond those of the ordinary commercial business, and that the most competent of management and the wisest of trade policies are essential to the maintenance of the business upon a successful basis.

2. *I have observed that the so-called "one man" business is not only started without an accurate knowledge of the capital requirements of the industry, but also without a crystallized conception of those trade policies which are really essential to commercial prosperity in this industry.*

So long as the business is very small in size—in fact, so long as it continues to be well within the limits of one man to operate—production costs are low, although by no means so low relative to the large producers as the small business believes. On the theory that production costs are very low, a trade is built up on a low price level relative to the normal market price of the industry. As the business grows, this low price level fails to maintain the business in prosperous condition, and about the time the business is ready to pass from the class C group to the class B group, growing begins to get difficult, financial embarrassments begin to manifest themselves and future stability is jeopardized if price policies are not adjusted more nearly to the normal market levels.

3. *There is a great tendency throughout the industry to indulge in mass competition. I mean by this, a tendency to confine production to strictly standard products which many well-developed companies are manufacturing.*

Particularly are the small companies prone to concentrate their energies on these so-called standard lines. With their limited capacity, they might far better engage in specialty production and keep away from mass competition, both to their own and the general market advantage.

4. *In the electrical business, as in all other industries, there are numerous companies operating without adequate cost-keeping systems, and sales policies are based upon erroneous conclusions as to what actual costs are.*

By virtue of the very slow turnover in the manufacturing operations of the electrical business, it is considerably more difficult to ascertain reliable costs and to keep posted up to the minute on costs than in the majority of lines of other manufacturing business. Manufacturing costs on which commercial policies are based are frequently out of date. However, with the widening use of the very admirable "standard accounting and cost system" which the Electrical Manufacturers Council has published, the electrical industry is rapidly getting on a very much better cost keeping basis, and the possibility exists of the establishment of more intelligent commercial policies as a result thereof.

5. *It seems to be a besetting sin of the electrical manufacturing industry to endeavor to cover up unsound commercial policies, inadequate cost-keeping information, high costs of production because of out-of-date designs, and other phases of mismanagement by a constant endeavor to increase volume of sales for the purpose of reviving declining profits.*

This process overlooks the fact pointed out in the data of this discussion; namely, the tremendous amount of capital required to handle an increase of volume of sales ($1.41 of new capital, in round figures, on the average for all companies for $1 of additional sales). Because of this large capital increase required with new business, an increase in volume as a remedy for low percentage of profit in sales is almost a hopeless path toward happier operating results.

In conclusion, I would say that the capital requirements of the electrical manufacturing business are worthy of the most careful and continuous investigation, not only of the men already engaged in the industry, and the bankers who have advanced capital to assist in the operation of the industry, but also particularly worthy of the careful study of engineers who may be contemplating the starting of new businesses, and of capitalists whose financial support is being invited into new ventures in the field of electrical manufacture. We have a great business—one with a great future ahead of it—but it is a business which calls for management of the highest order, an intelligent knowledge of the fundamental economic facts involved, and a most careful determination of commercial policies essential to financial success.

Urged to Buy Coal Early

WASHINGTON, July 22.—Necessity of increasing production of bituminous coal prior to the peak movement during the fall months in order to avoid transportation shortages was pointed out in a statement issued last Friday by Acting Secretary A. Holmead of the Interstate Commerce Commission. The statement, in appealing to the public to buy coal at this time, particularly stressed a suggestion to the people of the Northwest that they buy their coal early in order to avoid a curtailment in the transportation necessary for the heavy movement of agricultural products.

Mr. Holmead pointed out that there are no definite records available as to present stocks, but as of Jan. 1, they aggregated 62,000,000 tons. At that time, railroad coal stocks totaled 19,367,956 tons as compared with 15,530,327 tons July 1, a decrease of 20 per cent. It is pointed out that if the same percentage of decrease is applied to the aggregate coal stocks, the figures as of Jan. 1 would be reduced to 46,600,000 tons, which, it is stated, may or may not be a fair approximation of the coal stocks of June 1 this year.

The members of the Electric Hoist Manufacturers Association report an increase in June business over May, both in the number of hoists ordered and their value; the number increasing 6.09 per cent and the value 7.35 per cent. There was a falling off in the value of shipments as compared with the previous month of 4 per cent.

The rail mill of the Indiana Steel Co. at Gary, Ind., has been shut down because of lack of business.

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THE IRON AGE

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Give Buyers the Facts

A RECENT delay in the publication of statistics of production, sales and surplus stocks of copper was explained by the statement that one important producer had decided to withhold such statistics in the future. Later the figures appeared as usual, but it was not indicated whether the withholding company had receded from the stand it had taken. The incident recalls the fact that some fifteen years ago or more a number of Central Western pig iron producers decided that in view of the unfavorable market conditions they would suspend publication of statistics of stocks. They argued, just as some copper producers are now arguing, that the publication of monthly figures tended to accentuate existing weakness in the market. It was the view of some producers at that time that buyers of pig iron had been given too much information.

It scarcely need be said that the action of the pig iron producers in the situation referred to did not tend to restore the confidence of buyers, nor did it lead to any early reversal of the policy the latter had followed of buying sparingly and expecting to make each succeeding purchase at a lower figure than the last. In fact, the discontinuance of the stock figures added for a time to the caution of buyers.

When both buyers and sellers have before them full information as to production and accumulations of metal in first hands, they are on an equal footing. When buyers have been led to enter the market and contract ahead at prices which later were not sustained, the result often has been that consumers postponed shipments under their contracts, sellers being left with orders which could not be converted into shipments. The ensuing complications are familiar.

It would be a step backward for the copper producers to return to the old days when the buyer was treated as a little less entitled to know what was going on than the producer. Buyers have a way of taking their own course when producers are inclined to be secretive. There is always the element of judgment as to the proportions demand will assume, even though there be the most complete information in respect to supply. A good illustration was furnished by the market of 1920. In a number of industries, conspicuously in rubber, the facts about stocks of crude and manufactured products were well known, but there were wide differences of opinion as to the rate at which the market could absorb these stocks. Here was play enough for the speculative factor which must enter to a greater or less extent into the decisions made in every business. There was no good reason to add any mystery as to what was happening to production and stocks.

More and more the cards are being put face up on the table. Producers and consumers have a common interest in saving the market from the dislocations due to the element of surprise. In the long run both profit by the free circulation of reliable information as to trade conditions. If the copper producers feel that they have long had the worst of the steady advertising of an excessive production, let them dwell for a little on what is now coming to the grain farmer from the wide circulation of the full data available on crop prospects, stocks and world demand for wheat and corn.

Railroads Function Well

IT is only a year and a half since fears were being expressed that the railroads would not be able to carry all the freight that would be offered. It was urged in the early months of last year that buyers of steel should lay in stocks, as they might be unable to secure prompt deliveries in the spring. Late in May came the first week in American railroading in which one million cars were loaded, but afterward million-car weeks became common.

The remarkable thing is that the disappearance of this transportation problem received so little attention. In many years the capacity of the railroad system was considered one of the vital factors in the commercial outlook. Often it had been said that we were prepared for great business activity, but it was doubtful if we should be able to do all we might want to do, as the railroads might be unable to contribute their share. Now we find ourselves supplied with ample transportation and we express little if any thankfulness for the condition.

It has been common to say that car loadings are not so heavy as a year ago, hence business is

poor. As a matter of fact railroad traffic is very heavy and it makes an excellent comparison with previous averages even though it falls behind that of last year. The reason the railroads are doing so well in moving freight and have many surplus cars is that they are functioning well, not that the volume of traffic is small. But the decrease in railroad traffic from a year ago is not large and nearly if not quite half the decrease is due to smaller coal movement. Since May 1 freight car loadings have averaged a trifle over 900,000 cars weekly, while in the same period of 1923 the average was scarcely 1,000,000, so that the decrease is less than 10 per cent, while coal loadings show a decrease of between 40,000 and 50,000 cars a week.

When the railroads function well there is a chance of their making some money, and so political demagogues seek to get some or all of their meager earnings away from them. Instead of trying to reduce railroad earnings we should all be thankful that the railroads are functioning so well that they have some earnings. Business in general would suffer, along with the railroads, if it were otherwise.

Incidentally the railroads are providing some employment for the steel industry at a time when such employment is greatly needed. The railroads bought rails quite heavily for this year and the deliveries are now going forward. There is also a fair volume of steel being made for freight car building. When large car orders were placed early in the year there was an impression that very quick deliveries were required and were going to be made. As a matter of fact the delivery times on several orders were extended almost as soon as the orders were placed. The deliveries up to date have been at quite a moderate pace, as shown by the statistics of the American Railway Association. The railroads are not now open to the criticism so often leveled at them before the war, that they gave the steel industry orders when orders were not needed, and withheld them when they were needed.

Much Steel for Japan

IN 1913 Japan was not a large factor in the export iron and steel trade of the chief producing countries of the world. Since the war, and especially because of the earthquake last September, Japan has been a leading buyer, particularly of American steel. These facts have been known in general; but the National Federation of Iron and Steel Manufacturers of Great Britain has compiled figures showing a larger Japanese demand than has been commonly supposed.

Japan in 1913 imported 56,656 tons per month of iron and steel from Great Britain, the United States, Germany, Belgium and Luxemburg. To this the United States contributed only 22 per cent, Great Britain 35 per cent, with the other three countries making up the remaining 43 per cent. In the last quarter of 1923 and the first quarter of 1924 exports of steel from the five countries to Japan have expanded to over 117,400 tons per month or more than 100 per cent in excess of those for the pre-war period. About 44 per cent came from the United States (against 22 per cent in 1913), while German, Belgian and Luxemburg makers furnished 29 per cent and Britain about 27 per cent.

Despite the fact that the United States has stepped into first place in this trade, our own export business is less than before the war and smaller in volume than that of any of the five nations except Germany. In other words, our foreign steel trade is too much dependent on one or two consumers.

Spies in Industry

THE use of spies forms the subject of an interesting article in the *Survey* by Richard C. Cabot. He discusses in a judicial way and at some length the spy system of getting information in time of war and in peace, and he admits that even in social work the results of a circular relating in part to this subject, and answered by 70 social workers in different parts of the country this year, leave him with the impression that something which he would call a spy system is not uncommon.

Mr. Cabot takes the broad ground that confidence in one another is at the root of the whole voluntary life of man, and that the spy system rests upon the violation of confidence. He does not place the stigma of a spy on policemen because his uniform and his recognized business make him a public guardian who, like the watchman of a building at night, is there to prevent crime, but without secrecy. He declares that the essential sin of the whole spy system is the double-faced attitude towards a person who has committed no crime. "Apparently," says Mr. Cabot, "we must be double-faced in relation to the criminal, though at times I begin to doubt it, and at any rate we do not need to treat our intimate associates as criminals." He adds that the fundamental question is, shall we carry out the methods of betrayal and of essential dishonesty in order to get information which we think we can put to good use?

A spy in time of war has been glorified, and the necessity for his service cannot be denied. In spite of Mr. Cabot's doubts, most people will approve the use of the spy in ferreting out crime; but any system of espionage in industry, politics, education, or social work is deplorable and seldom can be justified. It is true that in times of strike it seems to be necessary to fight fire with fire and, owing to the methods adopted by labor unions, manufacturing employers have felt the necessity of various forms of espionage, but, with the tendency of late years clearly toward greater frankness in the relation of employers and employees, the necessity for the service of the spy is gradually disappearing and in time he ought to be entirely without employment. An employee representation system that has working alongside of it a spy system is doomed to failure.

The *International Molders' Journal*, which is also discussing spies in its July number, is not confident, however, that the spy will soon disap-

pear. It bitterly arraigns union men who have "sold their honor" to serve employers, and points out that frequently their alleged service is not service at all but is really misinformation given for the express purpose of making trouble. The *Journal* points out that trade unions once were secret organizations and that need of secrecy no longer exists.

The spy undoubtedly thrived to the largest extent in the days of greater secrecy on the part of both employer and employees. He will go out of industry as secret methods gradually are abolished, and it is not too much to hope that in the service of the Government, in which the cost of secret methods tremendously increased in war times and has not rapidly decreased since the war, as shown by a New York newspaper last Sunday, the necessity for spies will diminish materially.

Steel Tonnages and Percentages

THERE is an excess of steel-making capacity in the United States over post-war requirements, as suggested by experience in the nearly six years that have elapsed since the Armistice. Thus outputs of steel expressed in percentages of capacity seem smaller.

Seeing that the official report of steel ingot production in June indicated an output equal to 47.4 per cent of capacity, which we assume at 54,000,000 tons per annum or 173,800 tons per working day, and that this exceeded most of the estimates currently made during June, one is putting the July rate low enough if he sets it at 40 per cent.

Certainly a 40 per cent producing rate looks like a poor one, but the 40 per cent is merely a reference to the existing productive capacity, and the capacity is only one fact in our general economic and industrial situation. The country does not owe a living to whatever steel-making capacity chances to be in existence. It minds its own business and takes whatever steel it wants and can pay for and use.

A 40 per cent rate in ingots represents 69,500 tons daily, or 21,600,000 tons annually. This is really no small tonnage. It is 54 per cent of the production in the twelvemonth ended June 30, a period of exceptional activity, and 62 per cent of the average rate in the five and a half post-war years to that date. Furthermore, it represents a rate 71 per cent as great as the production in the two best years before the war, 1912 and 1913, and a greater tonnage than was made in any year prior to 1906. Yet in 1905, the fifth year of the Steel Corporation's existence, we thought we had a very large steel industry and a very good consuming demand for its product.

By another comparison, this apparently poor 40 per cent rate is 90 per cent above the rate in July, 1921, and 12 per cent above the rate in the whole year 1921.

By still another comparison, it is nearly two and one-half times the rate of steel ingot production in Great Britain in the first half of this year, and reduced to terms of rolled steel or commercial steel it is more than one and one-half times as great as were the maximum exports before the war of the steel-producing countries to the non-producing countries or countries of insignificant production.

Much disappointment if not actual loss is likely to result to the steel trade and to business generally if this thing is not considered in its proper bearing. We may be led to think the country is consuming scarcely any steel when it is consuming a great deal, or that jobbers and manufacturing consumers are using their stocks when they are really receiving fresh steel right along.

An excuse may be given for clamor that the steel makers ought to reduce their prices so that the public can resume buying, even that the producers should take a loss for a time so that eventually they may work up to a 100 per cent operation.

It will be better in the long run if we consider that we are not doing so badly even at the present time. Industry is somewhat depressed and is taking less steel at the moment than it would take on the average over a period of time, if it continued at its present stage of activity, but that is all. A particularly bad blunder will be made if it is thought that since the steel industry suddenly limbered up in March to a producing rate considerably over double the present rate it is likely soon to do so again. It is a fairly safe working rule that the steel industry will never do a given thing twice under similar conditions.

CORRESPONDENCE

The Metricist

To the Editor: Referring to your editorial note on metricists in the July 10 issue of THE IRON AGE, the endeavor of figuring a saving in "lost productive power during school," etc., is imaginary and foolish and hurts the metric movement more than it was intended to help.

I have worked with both systems for years, the English and the metric, and personally prefer the metric system. However, I admit as well that if I had a large enterprise and had to stand for the change out of my own pocket, the English system would look good enough for me.

Let us be honest on both sides. The metric system is the more flexible and more suitable of the two. On the other hand, the expenditures involved form a very logical barrier for the change from the English to the metric system. The only sound argument is: Jefferson changed our monetary system from the pounds and shillings system to the present dollars and cents system, a decimal system. We were all glad and but a few kicked, because it did not involve too heavy expenditures.

The metric system once introduced, would be just as welcome, but who will pay the enormous bill. If we should have to choose between paying a bill for a war or the metric system, then the metric system would have the preference, but in our case the man who pays the bill has the say, and I would feel the same if I were owner of a large plant. J. J. STUNZI.

Lancaster, Pa., July 15.

Foundry operations in Ohio declined slightly in June as compared with May, according to the monthly report of the Ohio State Foundrymen's Association. The average operations of the foundries reporting was 72 per cent of capacity as compared with 75 per cent during May.

REFUSES TO INTERFERE

Interstate Commerce Commission as to McKinney Steel Co. Contract

WASHINGTON, July 22.—Announcement was made today that the Interstate Commerce Commission had declined to conduct a formal investigation into a contract between the McKinney Steel Co., Cleveland, and the New York Central Railroad, giving the steel company exclusive rights to purchase approximately 90 per cent of the railroad's scrap based on THE IRON AGE quotation of heavy melting steel at Pittsburgh. The contract became effective on Jan. 1, 1924, and expired June 30, but it was not made known whether it was renewed.

The contract gave the McKinney Steel Co. the right to purchase all of the New York Central Railroad's heavy melting steel, all wrought iron scrap except requirements of the Phoenix Horse Shoe Co., all bushelling, borings, turnings and drillings with the McKinney Steel Co. reserving the right not to purchase certain kinds of heavy melting. The price was f.o.b. terminal railway interchange track, Cleveland, based on the average weekly market quotation of No. 1 heavy melting, f.o.b. Pittsburgh, as published in THE IRON AGE under "A Comparison of Prices" for the month immediately preceding the month when the material is assorted and weighed plus $1 per gross ton as a base price. It was claimed by the railroad company that this method of disposing of its scrap instead of by competitive bidding would save it a great deal of money by making it unnecessary to build added equipment for assorting scrap. The assorting by the contract is done by the McKinney Steel Co. and charged to the railroad company.

Some scrap dealers and others protested that the railroad company would get less for its scrap under the contract and therefore cause a loss of revenue and justified an investigation under the Interstate Commerce act. The accuracy of THE IRON AGE figures, it was held by the railroad company, instead of resulting in a loss of revenue, saved it considerable revenue.

FEW INQUIRIES FOR EXPORT

Stiffened American Export Prices—Foreign Oil Fields of Promise in Export Buying

NEW YORK, July 22.—Export to the Far East, South American markets and Cuba continues fair despite the slight tightening in prices that has evidently occurred on most products. Except on particularly acceptable specifications, mills are apparently unwilling to shade 2c. per lb. base, Pittsburgh, on bars and on light gage black sheets for Japan only slight concessions from $89 to $90 per ton, c.i.f. Japanese port, are obtainable. Probably difficulty in establishment of credit is the principal obstacle in Japanese merchant buying. Municipal and Imperial Government buying and the purchases of the larger interests in Japan continue in fair volume. The Chinese markets are quiet and merchants evince little or no interest in quotations, even at concessions from the prevailing price level.

Among pending inquiries from Japan are the 5600 tons of structural steel for Osaka municipality; 4000 boiler tubes for the South Manchuria Railway Co., several thousand boxes of tin plate for the Japanese army; 212 tons (88,850 pieces) of tie plates for the Imperial Government Railways; and a fair volume of light gage black sheet inquiries. The only municipal railroad inquiry still open last week, that of the Kioto Electric Railway for 2½ miles of 92-lb. grooved rails, has been awarded to Mitsui & Co., New York.

Foreign interest in oil field pipe is keeping pace with domestic activity. The Andean National Corporation, New York, is asking for prices on a total of 360 miles of 10-in. line pipe for use in Colombia and there are continued small shipments of oil field pipe for use in Venezuela, Argentina and other oil fields. With the exception of the Argentine Government fields, the Standard Oil Co. and the Asiatic Oil Co., which has also been active in purchases of late, seem to be the controlling factors behind subsidiary companies.

Despite the low pig-iron market of several months, there are reports of importation of foreign iron on a small scale. Small tonnages of pig iron from the Tata works in India have been arriving from time to time. An importer in New York, who has imported a few small lots of Continental iron, is reported to be contemplating the purchase of a large lot of iron to be delivered over a period of time. It is believed by importers familiar with pig iron importation that any serious effort to sell foreign pig iron to consumers along seaboard would depend entirely upon an upward movement of the domestic market for the fourth quarter.

Six Cities to Get Gas from Troy Coke Plant

Mention was made in THE IRON AGE of June 26 of the contract entered into by the Foundation Co., New York, for the furnishing of gas to cities that can be reached conveniently from the proposed by-product coke plant near Troy, N. Y. It is now announced that a contract has been signed by the Foundation Co. with the Hudson Valley Coke & Products Corporation for the building of the coke plant, which will include an auxiliary water gas plant for making blue water gas for heating ovens and carburetor water gas for the supply of six Hudson valley cities. The total cost of construction will be about $2,500,000. It is in connection with this contract that the Burden Iron Co.'s furnace near Troy is to be modernized under the supervision of the Foundation Co. at a cost of approximately $1,000,000. The construction company also has been awarded a contract by the Adirondack Power & Light Corporation to build 17 miles of 12-in. pipe line to carry gas under high pressure from the gas plant near Troy to Schenectady. This will involve an expenditure of about $350,000.

The Hudson Valley Coke & Products Corporation represents the joint undertaking of the Burden Iron Co., the Oliver & Snyder Steel Co., E. Arthur Tutein Co., Inc., and others. It will operate the blast furnaces and coke ovens and will also supply gas under 20-year contracts to Albany, Troy and Schenectady, and through Albany to Rensselaer, Cohoes, and Watervliet. The new company can supply gas to these cities much more cheaply than can the isolated plants upon which they now depend. This move, unique in the field of gas supply, is, therefore, in the direction of economy. It suggests the central super-power stations being built throughout the country to supply cheap power to industrial communities.

McMyler Interstate Co., Cleveland, Acquires Industrial Works, Bay City

The McMyler Interstate Co., Cleveland, has completed negotiations for the purchase of the Industrial Works, Bay City, Mich., subject to the approval of the stockholders of both companies. A special meeting of the stockholders of the former company will be held Aug. 22 to secure ratification of the agreements and to approve new financing plans. The name of the McMyler company will be changed to the North American Equipment Co., and the present capital structure will be readjusted to meet the demands of the enlarged company. Stockholders will be asked to approve an increase in the capital stock from 30,000 to 250,000 shares of no par stock. The McMyler Interstate Co. manufactures locomotive and other types of cranes, car dumpers and other handling equipment. The Industrial Works is the leading manufacturer of railroad wrecking cranes and also manufactures locomotive cranes. The Bay City plant will be kept in operation as a unit of the new company. Negotiations are under way also for the purchase of a large Eastern company.

European Markets Dull and Prices Weak

British Makers Look for Revival in Early Autumn—Falling Prices in Germany—Belgium Gets Brazilian Rail Order

(*By Cable*)

LONDON, ENGLAND, July 22.

PIG IRON remains dull and easier in price. Consumers show little inclination to contract at current values. Glasgow plants are closed for holidays, thus accentuating the quiet state. Producers now have little hope of a revival prior to early autumn.

Cleveland makers are asking a premium of 1s. on export sales. Hematite is weak with supplies abundant and two furnaces are being damped. Alfred Hickman, Ltd., Midlands, has closed owing to labor disputes.

Foreign ore is dull and Bilbao Rubio is nominally, 22s. 6d., c.i.f., tees.

Finished iron and steel demand is poor, except in one or two Indian Government contracts for railroad material. Prices are unchanged, but finished iron is tending firmer. Midland electric Mfg. Co., has secured the contract for house service fuses for electricity supply development at Cartagena, Colombia.

Continental business here is stagnant. Neither buyers nor sellers are keen to book orders. Merchant bars have again sold for India at £6 17s. 6d., cost and freight.

German billets are offered at £6 c.i.f., Wales but all quotations generally are nominal.

In Belgium on July 1, 48 blast furnaces were blowing, an increase in the month of three furnaces. The Cockerill and the Ougree-Marihaye works have received a joint contract for 12,000 tons rails for Brazil.

In Germany the position is growing worse owing to the shortage of money. Makers are reducing prices in the effort to clear stocks.

Tin plates are steady. Home consumers have placed good quantities with deliveries spreading to the end of the year, but export demand is poor.

Galvanized sheets are strong, though fresh demand is moderate. Makers are well sold, quoting October as the earliest possible shipment on large orders. Black sheets are quiet and unchanged.

GERMAN STEEL REDUCTIONS

Some Downward Readjustments in Finished Steel Were Out of Line

(*By Radiogram*)

BERLIN, GERMANY, July 19.—Steel bars are now obtainable at 122 gold marks per metric ton (1.34c. per lb.) against 125 m. on July 1 and 135 m. in the middle of June. (Then they were 42 per cent above the 1914 pre-war price and now are 28 per cent above it.)

Thin sheets are quoted at 175 gold marks, whereas in the middle of June they were 185 m. (In the month, the ratio to the 1914 pre-war price has dropped from 1.54 to 1.46.)

Meanwhile steel ingots remain at 90 m. per metric ton, the price also of a month. (The ratio of the price of ingots today and before the war is still 1.09, with the scrap ratio also 1.09, but finished steel from 1.20 to over 1.60, so much is the market still under the influence of speculators.)

SHEETS ACTIVE IN FRANCE

Generally Steel and Iron Quiet and Prices Not Over Strong

PARIS, FRANCE, July 11.—Orders remain few and unimportant and prices are stationary, with a weak tendency. In the domestic market competition is very keen and this can only bring a decrease in the prices.

British and Continental prices per gross ton, except where otherwise stated, f.o.b. makers' works, with American equivalent figured at $4.40 per £1, as follows:

Durham coke, delivered	£1	7s.		to £1	7½s.	$5.94	to	$6.05
Bilbao Rubio ore†	1	4				5.28		
Cleveland No. 1 foundry	4	12		and 4	13	20.24	and	20.46*
Cleveland No. 3 foundry	4	7		and 4	8	19.14	and	19.36*
Cleveland No. 4 foundry	4	6		and 4	7	18.92	and	19.14*
Cleveland No. 4 forge	4	5		and 4	7	18.70	and	18.92*
Cleveland basic	4	5		and 4	6	18.70	and	18.92*
East Coast mixed	4	15		to 4	16	20.90	to	21.12
East Coast hematite	4	19		to 5	0	21.78	to	22.00
Ferromanganese	16	0		and 16*		70.40	and	70.40*
Rails, 60 lb. and up	8	10		to 9	0	37.40	to	39.60
Billets	7	15		to 8	5	34.10	to	36.30
Sheet and tin plate bars, Welsh	8	12½				37.95		
Tin plates, base box	1	2⅝		to 1	2⅞	4.98	to	5.03
						C. per Lb.		
Ship plates	9	5		to 9	15	1.81	to	1.91
Boiler plates	13	0		to 13	10	2.55	to	2.65
Tees	9	7½		to 9	17½	1.84	to	1.94
Channels	8	12½		to 9	2½	1.69	to	1.79
Beams	8	7½		to 8	17½	1.64	to	1.74
Round bars, ¾ to 3 in.	9	15		to 10	5	1.91	to	2.01
Galvanized sheets, 24 g.	18	5		to 18	10	3.58	to	3.63
Black sheets, 24 gage	13	5				2.60		
Black sheets, Japanese specifications	15	5				3.00		
Steel hoops	10	15		and 12	10*	2.11	and	2.46*
Cold rolled steel strip, 20 gage	17	0				3.34		

*Export price. †Ex-ship, Tees, nominal.

Continental Prices, All F. O. B. Channel Ports

(*Nominal*)

Foundry pig iron:								
Belgium	£4	2½s.	to £4	5s.	$18.15	to	$18.70	
France	4	2½	to 4	5	18.15	to	18.70	
Luxemburg	4	2½	to 4	5	18.15	to	18.70	
Billets:								
Belgium	5	17½			25.85			
France	5	17½			25.85			
Merchant bars:					C. per Lb.			
Belgium	6	7½			1.25			
Luxemburg	6	7½			1.25			
France	6	7½			1.25			
Joists (beams):								
Belgium	6	7½			1.25			
Luxemburg	6	7½			1.25			
France	6	7½			1.25			
Angles:								
Belgium	8	0	to 8	5	1.57	to	1.62	
⅛-in. plates:								
Belgium	7	17½			1.55			
Germany	7	17½			1.55			
⅜-in. plates:								
Luxemburg	7	17½			1.55			
Belgium	7	17½			1.55			

Coke.—The price is maintained at 150.75 fr. frontier station, Sierck (all ORCA's charges included). Since July 1 the German metallurgical coke has been reduced from 36.40 to 27 gold marks; calculating the mark at 4.50 fr. we obtain the price of 121.50 fr. to which must be added, say, 50 fr. for the transport, customs and other expenses, which makes it over 170 fr. per ton. In asking 145.25 fr., the French Government allows a reduction of 25 fr. per ton to the metallurgical trade. This is the reason why the price of German coke has not been further lowered. However, the question is how the Belgians are able to reduce the price from 156 to 143 fr., or in French currency, 128.60 fr.?

Iron Ore.—There is such a shortage of labor that in spite of production being pushed forward with the greatest energy, the output is still insufficient to cover all requirements. Belgium particularly is complaining of the short deliveries. They have, however, reached 2,665,285 tons for the first five months of 1924 (or a monthly average of 533,000 tons). They were large in May with 600,000 tons. For the same period of time Germany has been supplied with 468,000 tons (monthly average 93,600 tons) and 139,000 tons in May, but she had to purchase the remainder in some other region. Great Britain received 239,000 tons from January to May (monthly average 48,000 tons), while her imports in May were only 30,000 tons. Despite the situation, prices remain unaltered at 22 fr. for the ordinary grade and 26 fr. for the 38 per cent quality.

Pig Iron.—The market is heavy. Demand both at home and at export is not strong, while production is progressing and competition is increasingly active. Producers are obliged to store supplies and buyers take the opportunity to reserve orders in the expectation of a fall in prices. It seems, however, that rock bottom prices have been reached, considering the price of coke, the uncertainty prevailing as to the indemnity deliveries after July 31, and the probable revival of export if sterling exchange remains at or exceeds 85 fr., about to £1. The average price of a founders' cooperative association was established at 348 fr. in June. So far in July the average rate is about 340 fr. ($17.35), but certain plants of the Lorraine region have accepted larger orders at 335 fr. per ton at works. This price is expected to extend to Meurthe-et-Moselle. For export, No. 3 is quoted by the Belgians at 390 to 395 fr. ($19.90 to $20.15); Luxemburg, 395 to 400 fr. ($20.15 to $20.40); Lorraine, 400 to 405 fr. (390 Belgian fr. = 345 French fr.). In hematite, as there is very little competition from Great Britain, whose prices, owing to exchange, are higher than ours, prices are well sustained; they range generally between 430 to 460 fr. at works. A price of 400 fr., however, has been recorded in the South.

Ferroalloys.—Owing to the fall in the price of British ferrosilicon, the French Comptoir in charge of the marketing of this product, on July 4, lowered prices by 20 fr. to 1,100 fr. for 45 per cent; by 50 fr. to 1,850 fr. for the 75 per cent. Silico-manganese and ferrochrome are unaltered. On the open market ferrosilicon has been sold at 565 fr. per ton for the 10 to 12 per cent, and at 780 fr. for 25 per cent. Owing to the rise of sterling, ferromanganese now exceeds 1,475 to 1,500 fr. f.o.b.; spiegeleisen of 10 to 12 per cent manganese, 540 fr. at works.

Semi-Finished Material.—Plants are well booked ahead, but prices are still variable. There is good request for billets at export. In basic steel and per 100 kilos domestic prices are 43 to 44 fr. for blooms; 45 to 47 fr. for billets. At export, f.o.b. Antwerp, the Belgian plants quote 520 to 530 fr. ($20.75) for blooms; 560 to 570 fr. ($28.75) for billets; while the Luxemburg plants quote respectively 520 to 525 fr. and 560 to 565 fr.; the Lorraine works 525 to 530 and 565 to 570. These prices being nominal are the object of concessions.

Rolled Steels.—The market is variable according to region. There is still a rather poor supply of orders in beams and competition between producers is getting more and more active. There is a fair amount of stocks in the plants and this affects the prices. We hear that the exceptional price of 50 fr. per 100 kg. has been quoted, but the average is rather between 51 and 53 fr. (1.20c. per lb.). An adjudication of standard rails for the State Railways has been given to the Acieries de Longwy at 497 fr. ($25.50) per ton at works. In rolled steel in general delivery is made in three to five weeks for large sizes and two to four months for medium and small shapes. Prices vary according to the state of the order books and the dimensions of material, between 56 and 65 fr. per 100 kilos (1.3c. to 1.5c. per lb.) at works. The export rates for beams are £6 5s. to £6 7s. 6d. (with sterling at 84 fr. = 525 to 535.50); for bars, £6 7s. 6d — £6 10s.

Sheets.—Rather good activity, in heavy grades more particularly, is reported. There are large requirements to cover and prices are steady. The following are recorded:

	Fr.	Per Lb.
Large flats	68 to 70	1.57c. to 1.62c.
Heavy sheets	72 to 78	1.67c. to 1.87c.
Medium sheets	79 to 85	1.83c. to 1.97c.
Light sheets	96 to 105	2.22c. to 2.43c.

Belgian export rates are:

	Fr.	Per Lb.
5 mm. and over	725 to 735	1.50c.
3 mm	280 to 800	1.60c.
2 mm	825 to 850	1.70c.
15 to 10	925 to 950	1.90c.
10 to 10	1,050 to 1,100	2.20c.
5 to 10	1,250 to 1,300	2.60c.

The German prices are £7 10s. for heavy grades (610 fr.) and £7 12s. 6d. to £7 15s. for assorted grades.

GERMANY COMPETES IN BELGIUM

Belgian Prices Unsteady and Market Weak—India, China and Japan Offer Export Possibilities

ANTWERP, BELGIUM, July 5.—The market continues uncertain, only a few sizable orders having been booked. The firmness of the dollar and the pound sterling is of advantage to export sellers, enabling them to book some business in the face of foreign competition, particularly from Germany. Lower prices have been accepted by many makers on desirable business, the larger part of which was iron bars and beams for the Indies. On most products prompt deliveries are generally offered, which, although showing the light backlog of business, enables mills to obtain orders that might otherwise be lost to foreign competition.

Ruling prices for domestic consumption, per metric ton, f.o.b. makers' works, are about as follows:

	Fr.	$
Foundry iron No. 3	410	$18.50
Basic	400	18.10
Commercial iron No. 2	600	27.15
No. 3	625	28.30
No. 4	675	30.55
Sheets, 5 mm. and heavier	750	33.90
Sheets, 1.5 mm.	950	42.95
Galvanized sheets, 1 mm.	1,850	83.70
Iron bars, base	600	27.15
Rails	675	30.55
Open-hearth steel, ordinary	600	27.15
Basic Bessemer ingots	450	20.35
Blooms	525	23.75
Billets	550	24.90
Galvanized wire	1,350	61.10

Steel prices, which are low for domestic business, are still lower on export orders. On iron bars, for instance, orders have been placed at prices such as £6 7s. 6d. f.o.b. Antwerp, to compete with foreign quotations. Although the situation is far from firm and there seems to be a distinct tendency toward reduction, there are some fairly large inquiries in the market accumulated in the past two or three weeks and buyers apparently find present quotations interesting. If exchange continues firm, it is expected that a fair volume of foreign business will be booked. At present, India, China and Japan seem to offer the greatest possibilities for export business. For export light beams have been quoted as low as £6 5s. or $27.10 per gross ton f.o.b. Antwerp; corrugated bars at 725 fr. or $32.80; rods, 740 fr., $33.45. Lorraine offers have disappeared from the market but Luxemburg makers are quoting in the Belgian market on nearly the same basis.

The sheet market is quiet, but although there is little or no business, price cutting has not developed as has been the case in most other steel products. Some of the large works are still well booked for several months, mostly with domestic business. Export is practically

impossible in the face of German competition. Iron bars have been reduced considerably. For export, orders have been booked as low as 600 fr. or $27.15 per ton f.o.b. Antwerp. Makers are in need of tonnage and further concessions could probably be obtained if orders were in sight.

Pig iron prices continue practically unchanged but with firm offers in hand, buyers are finding it easier to obtain small concessions. This weakness is probably a result of offers again appearing from furnaces in Lorraine at competitive prices. Nominally No. 3 foundry iron is 410 fr. or $18.30, but it is certain that for large orders buyers could obtain as low as 405 fr. and perhaps 400 fr., a reduction of 25c. to 46c. Even these prices are not low enough for export business. In fact, 84s. or $18.20 f.o.b. Antwerp, seems not at all attractive either to British or American buyers. Belgian hematite pig iron is still high and fair tonnages of English East Coast hematite are being imported. Recent reductions brought prices under 102s., c.i.f. Antwerp. It is reported that a Belgian furnace is about to resume the production of semi-phosphorus pig iron (phos. 0.6 to 0.8 per cent) for domestic and export sale. Prices are not yet known, but must of necessity be low to compete with German and Dutch quotations, which are about 90s. or $19.50 f.o.b. Antwerp, about 430 to 435 fr.

Semi-finished materials are stronger than the rest of the market. Works are still well booked ahead and demand continues good both from domestic consumers and from abroad. Prices are unchanged.

German coke has been reduced about 10 fr. per ton. The price for Belgian coke will have to be reduced accordingly. This would certainly have facilitated a reduction of prices for all kinds of pig iron if French iron ore, largely used in Belgium, had not been increased by 6 to 8 fr. per ton.

Increased German Competition Expected

Credit Restriction and Low Wages Reduce Prices—Export Trade Small but Is Increasing—Mills Expect Improvement with Dawes Plan in Force

BERLIN, GERMANY, July 7.—Present indications point to increasing German competition in the international iron, steel and machinery markets. Domestic business is still slackening, but the theory that the Reichsbank's severe credit-restriction policy would lead to a price decline which would precede a revival of buying at home and abroad seems to have been justified. Lower prices have been attained, and from Austria and Czecho-Slovakia come reports of active German selling of iron, steel and manufactured metal products. The only factor making for better domestic sales of iron and steel is a moderate revival of building. In general, consumers of steel are compelled by the credit stringency to confine purchases to a minimum and stocks held by dealers are still being sacrificed to obtain cash. In the last fortnight money rates have fallen somewhat, and this has accelerated the price decline. Since May 7 the cost-of-living index number (100 in 1913) has fallen from 115 to 111 and the wholesale index, which formerly was much higher than the cost-of-living index, has dropped to 112.6. In particular the group of minerals, including iron, steel and coal, declined to 119.83 on July 3, against a high point of 170.08 immediately after the currency stabilization last fall.

On July 1 coal prices were reduced about 20 per cent. Standard Ruhr coal was cut from 20.60 to 16.50 goldmarks per metric ton, foundry coke from 37.90 to 28 m. These are the prices at the mine of the Rhenish-Westphalian syndicate. The coal operators claim that they cannot mine profitably at these prices, but that it is essential to increase sales. Of late Silesian coal has penetrated to West Germany, and British coal has also been sold cheaper, being purchased even on the borders of the Westphalian mine district. Despite the recent reduction, British coal will be able to compete on the North German coast. The Pig Iron Syndicate has made average reductions for hematite of 5.50 goldmarks per metric ton; foundry iron 7 m; Siegerland steel-making iron, 5.50 m.; and spiegeleisen, 7 m. Pig iron prices, which on an average have been reduced 5½ per cent, vary for different districts. The Syndicate explains the price reduction by the light demand, pointing out that smelting at these prices is at a loss. No announcement has been made of a reduction of steel or rolling-mill products. All recent attempts to enforce minimum prices in this market have failed. The Iron Founders' Association has cut prices from July 1 by from 4 to 10 per cent.

Ruhr Works Await Application of Dawes Plan

The financial situation of the western steel and coal industries is serious, and is not expected to improve materially until the Dawes report is in force. At the beginning of this month the Ruhr industrials were obliged to renew, with certain modifications, the agreement with the French "Micum" commission concluded on April 15, following expiration of the first agreements entered into last fall. Both parties reserved the right to terminate the agreement on a month's notice. Unless terminated, the agreement is to continue in force until the application of the Dawes recommendations. The coal tax payable to the French was cut from 1.50 to 0.75 goldmarks per ton, the import and export duties both on foreign trade and on business with unoccupied territory were reduced one-half, and the transportation tax on coal by-products was reduced to 1 per cent.

In spite of unfavorable reports, increased German competition is reported. The principal export movement is eastward. Austria's imports of German metal goods rapidly increased in the first few months of this year. German prospects in the Balkans are good, as Czecho-Slovakia's industry is occupied producing for domestic needs, and the Polish mills are in a critical condition with declining production. Exports, however, show no sign of recovering to the figures of 1922 before the disorganization that followed the Ruhr occupation. The wire industry is poorly employed and prices are depressed. Rolled wire is quoted as low as 135 m. per ton, drawn wire at 182 m., and wire nails at 190 m. The supply in wire nails is largely in excess of the demand.

Solingen Works Affected by Financial Crisis

Conditions in the Solingen cutlery, hardware and steel industry are worse. The financial crisis has forced a few firms to decrease production, although orders are on hand sufficient to warrant continued operation. Generally the orders booked are small and the number of unemployed has increased to 20,000. Domestic orders are scarce and Czecho-Slovakia, Austria, Italy, Spain and the northern countries which formerly were good customers are buying but little at present. France and Belgium, which have been doing a considerable trade in Solingen goods, are cancelling many orders. Regular orders, though of small size, are coming from the United States.

Machinery Builders Feel Foreign Competition

The engineering industry is also depressed. The financial crisis forces prospective customers to restrict purchases. It is difficult to procure credits, even abroad, and many firms are introducing short time work and dismissing a large number of their employees. Mining machinery is lower in price, but orders are scarce. Specialties are in demand, but orders are only given if extended credits are granted. In machinery for testing

materials foreign trade is brisk, but in machine tools the United States, Great Britain and Belgium are quoting much lower prices. The automobile industry has sold comparatively few motor cars lately, which is to a great extent the result of keen foreign competition. Only in tractors a good trade is done.

Wages Low Under New Working Hours

The movement for lengthening of working hours under the law of last winter seems now to have come to an end, stability being more or less attained. In practically no cases have concerns which abandoned the 8-hr. day returned to it. The first investigation made as to working hours under the new system shows that two industries, the iron,. steel and metals, and the textile industry, have the longest working hours. The inquiry, which embraced companies employing a total of 2,453,523 persons, showed that in all branches 54.7 per cent of the employees now work longer than a 48-hr. week, and 13 per cent longer than a 54-hr. week. The effective percentages are even higher, as the investigation embraced the Saar district, where the German law lengthening the working day is not applied, and in this district the 8-hr. day is maintained practically everywhere. In the metal industry 63.5 per cent of employees work longer than 48 hours, and 21.1 per cent longer than 54 hours. As compared with the old system, this is a considerable lengthening of working hours, because not 48 hrs. a week but 44 to 45 was the old average. Wages continue very low. In the steel industry the average weekly wage of skilled workers is, where the 8-hr. day prevails, 28.80 goldmarks, and where longer hours are worked, 32.58 goldmarks, or less than $7 and $8 a week, respectively. In Cologne the weekly wage for 48 hrs. is $9, and in Breslau it is $5. For unskilled steel workers the weekly wage for the 48-hr. week is 22.08 goldmarks, and where the week is longer than 48 hrs., 24.92 marks. Nominal wages of skilled workers in the steel industry on the 48-hr. week average 79.6 per cent of those of 1913, but the average real wage (based on buying power) is only 69.6 per cent of that of 1913. The average unskilled worker's nominal wage for the 48-hr. week is 90.3 per cent of that of 1913, his real wage 79 per cent. As all reliable reports agree that per capita efficiency is almost as high as before the war, German ability to compete internationally can hardly be in doubt.

BRITISH MARKET DULLNESS

Little Activity in Early July—World's Shipbuilding Contracts

LONDON, ENGLAND, July 10.—The markets for iron and steel continue without any special feature and generally speaking the dull tone still prevails. There has been a little improved demand for pig iron, but not of any sufficient importance to uplift prices; in fact, the market has a decidedly weak tendency. The steel trade is very dull, except in the case of certain lines of sheets.

Makers cannot afford to grant concessions owing to the costs, and in consequence there is a talk of some blast furnaces being put out of commission. The present price of No. 3 Cleveland g.m.b. is about 88s., though there even merchant sellers at below this figure. Hematite continues steady, though still subject to Continental competition, and makers' prices are maintained at 96s.

In heavy steel one or two good contracts for railroad material have been placed for Indian purchasers, while the Admiralty have placed all the steel requirements for the five new cruisers. For two of these, which are being constructed at Barrow works, the Vickers concern has been awarded the contract for heavy gun mountings. The same firm is also supplying similar gun mountings for the two capital ships in process of construction at Birkenhead and on the Tyne. The Dutch Chamber has passed a credit of 2 million florins to carry out a contract with Armstrong, Whitworth & Co., Ltd., for the delivery of raw material. The ordinary merchant trade in iron and steel, however, is still very poor, chiefly owing to competition from Continental sources. Even here, although there have been attractive prices offered, not much business has been moving.

Ship Construction

Lloyd's Register of Shipping reports the total merchant tonnage under construction in Great Britain and Ireland at the end of the half year as 1,516,746 tons, and an increase on the quarter of about 43,000 tons and on the year of about 179,000 tons. The total merchant tonnage building in other countries amounts to 1,100,151 tons, and includes Germany and Danzig, 340,749 tons; France, 144,240 tons; Italy, 127,772 tons; United States, 103,665 tons, and Holland, 96,453 tons.

The total world tonnage actually in construction is 2,425,000 tons, or a little over a million tons below the highest pre-war record reached at the end of June, 1913. At present, there are under construction in the world 35 vessels of between ten and twenty thousand tons each, and eight of twenty thousand tons upward. Twenty-one out of the 35 are being built in the United Kingdom. Of the world total, 810,655 tons represents ships to be fitted with internal combustion engines and that of steam vessels 170,584 tons. It will be seen therefore, that the motor tonnage under construction is thus equal to nearly 45 per cent of the steam tonnage, which shows the remarkable development taking place in this system of propulsion.

British Pig Iron and Steel in June

LONDON, ENGLAND, July 20 (*By Cable*).—The pig iron production in June was 607,800 gross tons, which was not only a sharp decline from the May output of 650,000 tons but was the smallest for the year. Total steel output in June was also the smallest for the year at 651,500 tons, comparing with 809,700 tons in May.

Comparative production figures for the British steel industry in gross tons per month are as follows:

	Pig Iron	Steel Ingots and Castings
1913, per month.....	855,000	639,000
1920, per month.....	669,500	755,600
1921, per month.....	217,600	302,100
1922, per month.....	408,300	486,000
1923, per month.....	619,800	707,400
January, 1924.....	631,500	690,100
February	612,700	767,600
March	668,600	835,200
April	618,400	711,500
May	650,900	809,700
June	607,800	651,500

The total pig iron output for the first half of the year has been 3,795,000 tons, or 632,500 tons per month, which exceeds the monthly average for the last three years. The total steel output for the half year has been 4,451,000 tons or 741,900 tons per month, which exceeds the monthly average for 1921, 1922 and 1923.

McKeesport Tin Plate Co. Restores Wage Schedule

PITTSBURGH, July 21.—A settlement of the labor trouble at the plant of the McKeesport Tin Plate Co., McKeesport, Pa., was effected late last week and the company this morning started about half of its mills, which have been down on account of the strike of the workmen since July 11. Late last month the company cut the wages of the tonnage men 20 per cent and those of other classes of workmen 12 to 15 per cent. Only half-time employment being provided at the lower rate, the hot mill men failed to report for work July 11, and the entire plant was threatened with suspension with the exhaustion of steel supplies. At a conference late last week the management agreed to restore the wage schedules in effect prior to the late June cut and to reinstate the men who had gone out. The offer was accepted and was the basis of the settlement.

Iron and Steel Markets

DEMAND HAS IMPROVED

Some Repair of Over-Low Stocks, with Large Structural Contracts

An Increase in Operations—Further Recession in Finished Steel Prices

Improved demand for steel products is reported from all selling centers this week. Apart from structural work, of which the total is large because of the 24,000-ton contract on the Philadelphia-Camden bridge, the increased buying is plainly for the repair of stocks that have run too low. Thus it confirms recent opinions that some rebound was not far away.

The rate of steel production for the country is a trifle higher, but as nearly all orders are for prompt delivery, a plant may start the week at one rate and end at another. The Steel Corporation, with its great diversity of product, made the best showing, at 47 per cent, as the week opened, its Alabama plant being still on double turn. For all companies the percentage is about 40.

While better buying is generally recognized, there is like agreement in the report that prices of some leading products have given way. There has been a strong effort to hold plates and shapes in the Pittsburgh area at 2.15c., but as low as 2c. has been done on larger business, and in the East plates have sold on a basis that would mean 1.80c. if delivery were made from Pittsburgh. In bars there is the anomaly of a 2.15c. market at both Pittsburgh and Chicago.

Sheets, in which there have been marked variations for some months, have shown fresh weakness this week, and wire products are now $1 to $3 a ton below the recent level. Boiler tube buyers have had that market largely in their own hands.

Including 24,400 tons for the Philadelphia-Camden bridge, placed with the American Bridge Co., the week's awards of structural steel totaled close to 50,000 tons, the largest amount recorded in one week since the unusual activity of the spring months. A bridge in Oregon takes 6000 tons. New work reported amounts to less than 17,000 tons, but the building movement, even at the somewhat lessened rate, is still the strong stay of the steel trade. At the same time a good many structural shops are in need of work, and are making very low bids.

Railroad equipment buying is so light that orders for 25 locomotives from the New York Central and 10 from the New Haven road assume importance. The Texas & Pacific is inquiring for 20,000 tons of rails, and there is more activity in track fastenings. There is a persistent expectation of fall buying of equipment as one feature of the next forward movement in steel.

Further proof of the intention of steel companies to hold existing wage rates appears in the restoration in the past week of the 12 to 20 per cent taken in June from the wages of employees in a large independent tin plate plant in the Pittsburgh district.

The Federal Trade Commission's decision against the Steel Corporation in the famous Pittsburgh Plus case comes at a time when Pittsburgh basing is nonexistent as a market factor. For many weeks prices in the East and in territory naturally tributary to Chicago mills have been several dollars a ton below a figure representing the price at Pittsburgh mill plus freight to the buyer's plant. In the same period, also, the old-time Birmingham differential has gone by the board.

Unsold stocks of pig iron in furnace yards have been reduced to a low point and the market is firmer, although sales are of moderate volume and may not be equal to the present production, which is being still further curtailed this month, although to a less extent than in May and June. At Chicago foundry operations are little changed and recent pig iron buying was due to low prices rather than to immediate needs.

The decreased activity of blast furnaces is shown in the consumption of Lake ore, which amounted to only 2,793,203 tons in June, as compared with 3,830,457 tons in May and 5,816,139 tons in June last year. Ore on hand at furnaces and Lake Erie docks increased nearly 5,000,000 tons in June.

Following sales of ferromanganese by a domestic producer at $105, British sellers met that price by a reduction of $2.50 a ton this week.

The copper market has taken on more life and after dragging for months has advanced by ¼c. per lb. Recent sales included 4,000,000 lb. each to an electrical company and the Steel Corporation.

THE IRON AGE composite price for finished steel dropped $1.30 per ton in the week, or to 2.524c. per lb., the lowest figure in 18 months. As an index figure it stands at 149 against 100 for the ten-year pre-war average.

The composite price for pig iron remains, as for two preceding weeks, at $19.29 per gross ton, which is only 122 against 100 for the ten-year pre-war average.

Pittsburgh

Steel Orders Increasing as Prices Sag—Keen Competition in Sheets

PITTSBURGH, July 22.—Steel orders numerically still are on the increase and most companies expect the total booking for this month to show a gain over those for June, but as most orders are for small lots and for prompt delivery, few of the manufacturers are able to build up back logs. While the market appears to have struck bottom and made a moderate rebound, as far as business is concerned, the story is the reverse as to prices. A pretty strong effort to hold the market on plates and shapes in the Pittsburgh area at 2.15c., Pittsburgh, has failed and on two or three fair sized inquiries in the district the competition has forced a decline to 2c.

Keen competition for sheet orders has forced even lower prices than hitherto have prevailed. Real strength

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics
At date, one week, one month, and one year previous

For Early Delivery

Pig Iron, Per Gross Ton:	July 22, 1924	July 15, 1924	June 24, 1924	July 24, 1923
No. 2X, Philadelphia‡	$21.26	$21.26	$21.26	$26.56
No. 2, Valley furnace†	19.00	19.00	19.00	25.00
No. 2, Southern, Cin'ti†	22.05	22.05	23.05	29.05
No. 2, Birmingham, Ala.†	18.00	18.00	19.00	25.00
No. 2 foundry, Chicago*	19.50	19.50	20.00	27.50
Basic, del'd, eastern Pa.	20.00	20.00	21.00	25.50
Basic, Valley furnace	19.00	19.00	19.00	25.00
Valley Bessemer del. P'gh	21.76	21.76	22.26	28.26
Malleable, Chicago*	19.50	19.50	20.00	27.50
Malleable, Valley	19.00	19.00	19.50	24.50
Gray forge, Pittsburgh	20.26	20.26	20.76	26.26
L. S. charcoal, Chicago	29.04	29.04	29.04	32.15
Ferromanganese, furnace	105.00	105.00	107.50	117.50
Rails, Billets, Etc., Per Gross Ton:				
O.-h. rails, heavy, at mill	$43.00	$43.00	$43.00	$43.00
Bess. billets, Pittsburgh	38.00	38.00	38.00	42.50
O.-h. billets, Pittsburgh	38.00	38.00	38.00	42.50
O.-h. sheet bars, P'gh	38.00	38.00	40.00	42.50
Forging billets, base, P'gh	43.00	43.00	43.00	47.50
O.-h. billets, Phila.	43.17	43.17	43.17	47.67
Wire rods, Pittsburgh	48.00	48.00	48.00	51.00
	Cents	Cents	Cents	Cents
Skelp, gr. steel, P'gh, lb.	2.15	2.15	2.20	2.40
Light rails at mill	1.90	1.90	1.90	2.25
Finished Iron and Steel,				
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Iron bars, Philadelphia	2.42	2.42	2.42	2.67
Iron bars, Chicago	2.20	2.20	2.20	2.50
Steel bars, Pittsburgh	2.15	2.15	2.20	2.40
Steel bars, Chicago	*2.15*	2.20	2.25	2.60
Steel bars, New York	2.49	2.49	2.54	2.74
Tank plates, Pittsburgh	*2.00*	2.15	2.15	2.50
Tank plates, Chicago	2.25	2.25	2.35	2.80
Tank plates, New York	*2.1¼*	2.19	2.34	2.84
Beams, Pittsburgh	*2.00*	2.15	2.20	2.50
Beams, Chicago	2.25	2.25	2.35	2.70
Beams, New York	2.34	2.34	2.44	2.84
Steel hoops, Pittsburgh	2.60	2.60	2.75	3.15

*The average switching charge for delivery to foundries in the Chicago district is 61c. per ton.
†Silicon, 1.75 to 2.25. ‡Silicon, 2.25 to 2.75.

Sheets, Nails and Wire,	July 22, 1924	July 15, 1924	June 24, 1924	July 24, 1923
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Sheets, black, No. 28, P'gh	*3.40*	3.50	3.50	3.75
Sheets, galv., No. 28, P'gh	*4.50*	4.60	4.75	5.00
Sheets, blue an'l'd, 9 & 10	*2.60*	2.70	2.75	3.00
Wire nails, Pittsburgh	*2.85*	2.90	2.90	3.00
Plain wire, Pittsburgh	*2.60*	2.65	2.65	2.75
Barbed wire, galv., P'gh	*3.55*	3.70	3.70	3.80
Tin plate, 100-lb. box, P'gh	$5.50	$5.50	$5.50	$5.50
Old Material, Per Gross Ton:				
Carwheels, Chicago	$16.50	$16.50	$15.50	$20.50
Carwheels, Philadelphia	17.50	17.50	17.00	20.00
Heavy steel scrap, P'gh	18.00	18.00	16.50	17.00
Heavy steel scrap, Phila.	15.50	15.50	15.00	16.00
Heavy steel scrap, Ch'go	*15.25*	15.50	13.75	17.00
No. 1 cast, Pittsburgh	18.00	18.00	17.50	20.50
No. 1 cast, Philadelphia	*17.00*	18.00	17.50	20.00
No. 1 cast, Ch'go (net ton)	17.00	17.00	16.50	18.50
No. 1 RR. wrot, Phila.	18.00	18.00	16.50	18.00
No. 1 RR. wrot, Ch'go (net)	13.00	13.00	11.50	14.50
Coke, Connellsville,				
Per Net Ton at Oven:				
Furnace coke, prompt	$3.00	$3.00	$3.00	$4.50
Foundry coke, prompt	*4.00*	4.25	4.00	5.25
Metals,				
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Lake copper, New York	**12.87½**	12.62½	12.62½	15.00
Electrolytic copper, refinery	**12.50**	12.12½	12.25	14.50
Zinc, St. Louis	**5.92½**	5.85	5.75	6.10
Zinc, New York	**6.27½**	6.15	6.10	6.45
Lead, St. Louis	**6.85**	6.65	6.80	6.10
Lead, New York	**7.10**	7.00	7.00	6.25
Tin (Straits), New York	**48.75**	45.25	43.12½	39.62½
Antimony (Asiatic), N. Y.	**8.37½**	8.30	8.50	7.00

On export business there are frequent variations from the above prices. Also, in domestic business, there is at times a range of prices on various products, as shown in our market reports on other pages.

Composite Price, July 22, 1924, Finished Steel, 2.524c. Per Lb.

Based on prices of steel bars, beams, tank plates, plain wire, open-hearth rails, black pipe and black sheets

These products constitute 88 per cent of the United States output of finished steel

July 15, 1924,	2.589c.
June 24, 1924,	2.603c.
July 24, 1923,	2.775c.
10-year pre-war average,	1.689c.

Composite Price, July 22, 1924, Pig Iron, $19.29 Per Gross Ton

Based on average of basic and foundry irons, the basic being Valley quotation, the foundry an average of Chicago, Philadelphia and Birmingham

July 15, 1924,	$19.29
June 24, 1924,	19.54
July 24, 1923,	25.68
10-year pre-war average,	15.72

is lacking in hot-rolled flats, cold-rolled strips and regular market quotations on wire products are off $1 to $3 a ton from the recent quotations. So far the weakness in plates and shapes has not extended to steel bars, but revisions are looked for in price of that product when the larger producers begin seeking quarterly contracts. Boiler tube buyers are able to name practically their own prices on lap welded steel tubes and are getting steep concessions from quotations on seamless tubes. Pipe and tin plate prices still are holding, although buyers are expecting the former to eventually swing into line with other steel products and there is not enough demand for tin plate to seriously test the price.

The decline in finished steel prices naturally intensifies the expectation of the nonintegrated mills of lower prices for semi-finished steel. Not only is there argument for lower prices in the weakness of finished steel prices, but buyers cannot understand why billets and slabs should be at a differential of $19 a ton over pig iron. Sheet makers who do not produce their own sheet bars claim they cannot compete in the present market, even at $38 for sheet bars.

Independent steel companies in the Youngstown district have more ingot making capacity operation this week than before in some time, but this is partly explained by the fact that one company which has been down for repairs for several weeks started up this week. Taking the Pittsburgh and nearby district as a whole, there has been no appreciable gain in steel works operations. It is somewhat difficult to arrive at a definite estimate of the current rate of ingot production because practically all of the orders being for prompt delivery, a plant may start the week at one rate and end at another. The Carnegie Steel Co. has taken off one of its Isabella furnaces, but this loss is offset by the starting up of a Johnstown furnace of the Bethlehem Steel Co. which has been banked.

The pig iron market has been enlivened by a report that the Andrews Steel Co., Newport, Ky., had purchased 20,000 or 25,000 tons of basic iron from a Valley furnace. Careful checkup of Valley producers and those who might sell on a Valley furnace basis fails to disclose the seller. Pittsburgh steel companies show no indications of being stampeded into purchases of scrap by the recent activities of companies in outside consuming districts. There is no market worthy of the name in coal and coke.

Pig Iron.—The report that the Andrews Steel Co., Newport, Ky., had bought a large tonnage of basic iron appears to be authentic, but all producers in the Valley district, as well as those who might sell on a Valley basis, disclaim having made the sale and there is some skepticism that Valley iron is involved. It is pointed out that southern Ohio basic iron is available at $21.27, delivered, Newport, Ky. Since the freight from Valley furnaces is $3.65 a ton, the price of Valley iron would have to be $17.60, furnace, to compete with southern Ohio iron. While it has been estimated that a sizable tonnage of Valley basic iron might bring out a lower price than $19, it is doubted that any producer would make a cut of $1.50 a ton to get an order, regardless of its size. Few of the merchant producers have costs as low as $19, and it is doubted that steel companies can make iron much below that figure. Aside from the excitement created by the Andrews Steel Co. business the market has been dull and devoid of feature. We note one sale of 1000 tons of Bessemer iron at $20.39, delivered at Vandergrift, Pa. This iron will move from a western Pennsylvania furnace having a decided freight advantage over Valley furnaces. The latter have not gone below $20 on Bessemer iron. Claims still are made that sales of basic iron have been made at $19.50, Valley furnace, but $19 still can be done. Only small scattering lots of foundry iron are being sold and these at recent prices. The market is no stronger than it has been, although some producers, keeping in mind their costs, are disposed to talk higher prices.

We quote valley furnace, the freight rate for delivery to the Cleveland or Pittsburgh district being $1.76 per gross ton:

Basic	$19.00 to $19.50
Bessemer	20.00 to 21.00
Gray forge	18.50 to 19.00
No. 2 foundry	19.00 to 19.50
No. 3 foundry	18.50 to 19.00
Malleable	19.00 to 19.50
Low phosphorus, copper free	27.00 to 28.00

Ferroalloys.—Ferromanganese prices are lower. The cut of $2.50 a ton to $105, Baltimore, recently made by an Eastern steel company has been followed by a similar reduction by British producers and by commercial domestic producers. The cut has brought about no material increase in demand. The revolution in Brazil, it is feared, will cut ore shipments from that country, but as a factor in demand this possibility is not yet active. Spiegeleisen is easy and on fair sized tonnages $33, furnace, now is the ruling price on average 20 per cent material. Specifications against contracts are not absorbing production; hence the cut in prices. There is only a limited demand for 50 per cent ferrosilicon and not much firmness in prices. Most users had a surplus of this material from their first half contract shipments and their current requirements are so small that they are getting along without fresh purchases of any account. Such needs as are arising are being met by spot purchases and little success has attended efforts of producers to secure third quarter or last half contracts. Although the leading producer still holds to $75, delivered east of the Mississippi on this material, others are quoting $72 for either spot or future shipments and as low as $70 has been named to induce some consumers to take out unspecified tonnages. Prices are given on page 233.

Semi-Finished Steel.—While tests of the market by finishing mills have failed to uncover a lower price than $38, Pittsburgh or Youngstown, for billets, slabs and sheet bars, little or no business is resulting. Buyers feel that the spread between pig and scrap on the one hand and the semi-finished steel on the other is too wide and also are inclined to hold off because at $38 for the unfinished steel, there is no margin of profit at present prices of finished material. Furthermore, most nonintegrated steel companies have fair-sized stocks in relation to present bookings and the current rate of plant operation. Real prices of forging billets are indeterminate in the absence of sizable orders; since it is believed that a firm bid of $36 for rolling billets would get attention it is probable that forging billets could be bought $2 a ton below the common quotation.

Wire Products.—Business has improved to the extent that orders are more numerous than they have been, but the gain in volume has not been in keeping with the increase in the number of bookings. Manufacturers are encouraged to believe that jobbers and manufacturing consumers are going along with light and broken stocks, by the fact that all orders specify early delivery. Wire nails have settled to $2.85, base, per keg and plain wire to $2.60, base, per 100 lb. and a like decline is noted in regular quotations on painted barbed wire and polished staples. Galvanized barbed wire and fence staples now are quoted generally at $3.55, a drop of $3 a ton from former quotations. It seems that the special terms of discount in effect until recently, which allowed 5 per cent off for cash, made the price on these products $3.55 and this price continues, but in a public way now that manufacturers have gone back to the old terms of 60 days net and 2 per cent off for payment in 10 days. Woven wire fence is now quoted $60 per net ton base to jobbers and $65 per net ton base to retailers, the discount method of quoting having been abandoned by the leading interest. Coated nails are down to $2.25, base, per count keg in the revised price schedules, but some recent business is understood to have been placed at below $2.20.

Tubular Goods.—Fairly good demand still is observed for standard pipe, but it is chiefly for rounding out depleted stocks and few orders run large in any one size. Jobbers liquidated their stocks in the belief that pipe prices would move down with other steel products and are slow to abandon the idea that eventually there will be a drop in pipe prices; hence, they are not buying ahead of their real requirements. Overproduction in oil and the attendant low prices are holding down drilling operations and consequently the demand for oil well pipe. Much interest still is apparent in line pipe, but only one large order lately has been placed, this being for 70 miles of 12-in. plain end pipe for a gas line extension of the Manufacturers Light & Heat Co. in West Virginia. With the mills none too heavily obligated, this is a favorable time from a price standpoint to place line pipe business and on recent export orders buyers have not been disappointed in that respect. The boiler tube situation is as badly unsettled as ever; lap welded steel tubes are being quoted 4 fives beyond the card discounts; in the case of 4-in. and larger tubes, this means that instead of 46 per cent off list for carload lots, or 54 per cent on, the discount is about 56 per cent, or 44 per cent on. Commercial seamless tubes can be bought at about the same prices as lap welded tubes. None of the makers seem disposed to issue a new card detailing actual discounts, the reason being that there is so much uncertainty that the card would not be useful more than 24 hours. Some additional pipe capacity is in operation in the Youngstown district this week, but the leading interest is on half time schedule at its Benwood (Wheeling), W. Va., plant. Discounts are given on page 232.

Sheets.—Any betterment there is in the market is confined to the number of orders that are going on mill books, prices still are easy and that condition no longer is entirely confined to the common finished. The largest maker of low-priced automobiles is reported to have secured supplies of body sheets at 4.95c., base, and the 5.10c., base, has been departed from to the extent of $2 a ton, by those who did not participate in the business of the low-priced car maker. Prices as low as 3.40c., base, on black, 4.50c., base, on galvanized and 2.60c., base, on blue annealed lately have appeared and while not general they indicate the anxiety of some makers of orders that will insure operation. The American Sheet & Tin Plate Co. disclaims any de-

parture from its recent prices of 3.65c. for black, 4.80c. for galvanized, 2.80c. for blue annealed or 5.10c. for automobile body sheets, and claims bookings in excess of 60 per cent of average full capacity. Independent mills, particularly in the Youngstown district, are running heavier this week than before in fully two months, but the industry as a whole is not operating much more than 40 per cent. Prices are given on page 232.

Tin Plate.—The market still is dull and mill operations remain at about 50 per cent of capacity. General line tin plate is moving steadily, but not much activity yet has developed in plate for food containers. Some encouragement to future demands for packer can sizes is furnished by a report of the Department of Agriculture noting an increase in the acreage planted to green peas this year of 14 per cent over 1923 and an indicated crop 46 per cent greater than last year. Report on corn and tomatoes is due about Aug. 1. Whether production of tin plate and cans has been sufficient to take care of the food crops should be apparent in a few weeks.

Iron and Steel Bars.—The market here is holding comparatively well on steel bars at 2.15c. base, Pittsburgh, as makers are fairly well supplied with quick delivery orders and inquiries of a size to cause competition are not numerous. Iron bars also are holding at recent prices, although activity is lacking. Prices are given on page 232.

Structural Material.—Appearance of a few fair-sized inquiries within the Pittsburgh area have been followed by a rather sharp competition among producers, the result of which was seen in a drop in price to 2c. base, Pittsburgh. Mills continue to quote 2.15c., but that price refers now only to small tonnages. Local mills have been meeting competition in competitive territory and going at least to 2c., Pittsburgh, in such cases. Structural inquiries have grown fewer in the past few days. Plain material prices are given on page 232.

Cold-Finished Steel Bars and Shafting.—Orders are more numerous than they were a short time ago, but it takes a good many of them to create a sizable total. While automobile parts makers are releasing some tonnage, demands from that source are relatively light and purchases by other consuming industries are not compensating for the lack of automobile industry business. Rolled and drawn bars and shafting hold at 2.80c., base, Pittsburgh, but that price is not seriously tested by current demands. Ground shafting holds at 3.30c., base, f.o.b. mill, for lots of a carload or more.

Hot-Rolled Flats.—While makers find orders more numerous, they do not find them greatly increased in size and the chief point of encouragement is the fact that what is ordered is wanted promptly. Prices still show much irregularity and little strength. The common quotation on hoops, bands and strips is 2.60c., base, Pittsburgh, with some mills asking 2.75c., base, for narrow, light gage stock. But 2.50c. seems to measure the price on the bulk of strip sales and mills not regular producers have quoted 2.50c. flat, which, with the deduction of regular extras, works back to as low as 2.20c. and 2.25c. Prices are given on page 232.

Cold-Rolled Strips.—The effort still is being made to maintain a price of 4.50c., base, Pittsburgh, but too many makers are naming 4.25c. for the higher price to rule, except possibly on very small lots. Tonnages large enough to create competition are not moving at above 4.25c., and even that price has been shaded where a really desirable order is the stake, 4c., base, being mentioned. Some increase is noted in the number of orders, but not in their size.

Bolts, Nuts and Rivets.—Unprofitable prices for a period of almost a year have prompted one large maker here to make a stand at 65 and 10 per cent off list for large machine bolts, $2.60, base, for large rivets and 4.80c. off list for hot-pressed square nuts. This company recently withdrew lower prices that had been named to meet competition. The movement to stabilize price has found some support among other manufacturers, but subscription to it is not general enough yet to venture a verdict as to its success. Certainly, within the week, some business in bolts has been taken at well below former prices and there has been business in large rivets as low as $2.31.

Track Supplies.—Makers here who have been quoting small railroad spikes at $3.40, base, per 100 lb. have reduced the price to $3.25 and all makers now are at that level, long quoted by the American Steel & Wire Co. Other track supplies are at recent prices.

Warehouse Prices.—Effective July 16, warehouse prices for steel were reduced $2 per ton. New prices are: Bars, 2.90c., base; plates, ¼-in. and heavier, 3c.; 3/16-in., 3.25c.; shapes, 3c.; hoops and bands, 3.65c.

Plates.—Prices are materially easier. In conjunction with structural beams, several good sized lots of plates have sold at 2c., Pittsburgh, and while mills here continue to quote 2.15c., they have found it increasingly difficult to secure even small lots at that price. Prices are given on page 232.

Coke and Coal.—While there is a fairly good demand for foundry coke and producers report good specifications against contracts, supplies again are running somewhat in excess of current demands and prices are weaker. Choice brands for spot delivery still are commanding $4.50 per net ton at ovens, but good 72-hr.-coke is available as low as $4 as against $4.25, the recent minimum. The prevailing market on furnace coke is $3 per net ton at ovens, although this price occasionally is shaded to the extent of 10c. or 15c. a ton. This district does not seem to be sharing in the improvement in the general coal market. Very little Lake business has come to this district this year and local mines also have suffered from the fact that railroad and industrial consumers stocked coal so heavily early this year in anticipation of a possible strike of the miners. Mine run steam and coking coal still is quoted at $1.50 to $1.75 per net ton at mines and gas coal at $2. Slack grade holds firm because of small supplies rather than a good demand. Steam slack is bringing $1.20 to $1.25 and gas slack from $1.25 to $1.30.

Old Material.—Machine shop turnings have sold as high as $14.50, delivered this district, and sales of compressed sheets have established the local price at $16 as a minimum. Otherwise, the prices of a week ago are holding. Steel manufacturers in this district view with indifference the strength in outside consuming districts to the West. Their absence from the market makes it somewhat uncertain as to just where the market is on heavy melting grade, but such tests as have been made have disclosed no dealer willing to go below $18 for a pickup tonnage and yard material is not available at less than $19, while some insist they must get $20 for such stock to get out without loss. There is a deadlock and how it will be broken remains to be seen. An increase in steel orders and purchases of scrap would mean a victory for the dealers, but failure of the local mills to come in for supplies in the near future might well lead to a scramble by dealers to unload. The market just now is firm because of developments in other consuming centers and because there are not many loose tonnages on the market.

We quote for delivery to consumers' mill in the Pittsburgh and other districts taking the Pittsburgh freight rate as follows:

	Per Gross Ton	
Heavy melting steel	$18.00 to	$18.25
No. 1 cast, cupola size	18.00 to	18.50
Rails for rolling, Newark and Cambridge, Ohio; Cumberland, Md.; Huntington, W. Va., and Franklin, Pa.	18.00 to	18.50
Compressed sheet steel	16.00 to	16.50
Bundled sheets, sides and ends	14.50 to	15.00
Railroad knuckles and couplers	20.00 to	20.50
Railroad coil and leaf springs	20.00 to	20.50
Low phosphorus blooms and billet ends	21.50 to	22.00
Low phosphorus plate and other material	20.50 to	21.00
Railroad malleable	16.00 to	16.50
Steel car axles	20.00 to	20.50
Cast iron wheels	17.00 to	17.50
Rolled steel wheels	20.00 to	20.50
Machine shop turnings	14.00 to	14.50
Sheet bar crops	18.00 to	18.50
Heavy steel axle turnings	15.00 to	15.50
Short shoveling turnings	14.00 to	14.50
Heavy breakable cast	15.00 to	15.50
Stove plate	13.50 to	14.00
Cast iron borings	14.00 to	14.50
No. 1 railroad wrought	15.00 to	15.50
No. 2 railroad wrought	18.00 to	18.25

Chicago

Finished Materials Settle to Lower Prices as Signs of Improvement Appear

CHICAGO, July 22.—Prices of plates, shapes, bars, sheets, track spikes, track bolts and tie plates have settled to lower levels, but meanwhile the low point in demand appears to have passed and signs of gradual improvement are to be noted. A pronounced change in the market situation is hardly to be expected in midsummer, but sellers look for a slow, but steady, recovery, the effects of which will become apparent early in the fall. Bookings in bar mill products show the most noticeable betterment at present, and a revival of interest in rails and fastenings is also a source of encouragement.

An inquiry from the Texas & Pacific calls for 20,000 tons of rails, while the Terminal Railroad Association of St. Louis wants 2000 tons. Demand for wire products also shows improvement. Blast furnace and steel works operations are substantially the same as a week ago and it is now hoped that the next change will be in the direction of increased output. One of the blast furnaces of the Inland Steel Co. was banked for a few days last week for repairs, but has since resumed production.

Pig Iron.—Efforts to establish a minimum of $20 base furnace on local iron have met with some success, but it cannot yet be said that $19.50 has entirely disappeared as a going price. There is no question, however, that the position of producers is strengthening. Current output is at a low level and three-quarters of the stocks on furnace yards have been sold. On the other hand, melt in this territory shows little improvement, but a number of large tonnages have been bought during the week and several sizeable inquiries are pending. It is entirely possible that considerable tonnage has been and is being bought because prices are regarded as low rather than because of imperative requirements. A Milwaukee melter has closed for 5000 tons of foundry and malleable, while another user in that city has purchased 1500 tons of malleable. A southern Wisconsin plant has contracted for 900 tons of foundry. A northern Illinois melter is inquiring for 1400 tons of foundry for third quarter, and a local plant is in the market for 2500 tons of foundry for fourth quarter. A western Michigan user wants 1000 tons of malleable for delivery over the rest of the year. Inquiries from the Chicago and Milwaukee districts asking for shipment over the remainder of the year include 3000 tons of foundry and malleable, 500 tons of foundry and two lots of 500 tons of malleable. Silvery is weak, but price concessions are attributed to resale transactions. Charcoal is unchanged with few sales. There is little activity in low phosphorus and the lowest available price appears to be $31.79, delivered. A further drop in 14 to 16 per cent ferrosilicon brings it down to $43.42, delivered. An inquiry for 100 tons of 10 per cent silvery is current. Southern foundry is now available for shipment by barge and rail at $18 furnace or $22.18 delivered Chicago. Local sales made on that basis include one lot of 500 tons and another of 150 tons.

Quotations on Northern foundry, high phosphorus, malleable and basic iron are f.o.b. local furnaces and do not include an average switching charge of 61c. per ton. Other prices are for iron delivered at consumers' yards.

Northern No. 2 foundry, sil. 1.75 to 2.25	19.50 to 20.00
Northern No. 1 foundry, sil. 2.25 to 2.75	$20.00 to $20.50
Malleable, not over 2.25 sil.	19.50 to 20.00
Basic	19.50 to 20.00
High phosphorus	19.50 to 20.00
Lake Superior charcoal, averaging sil. 1.50, delivered at Chicago	29.04
Southern No. 2 (barge and rail)	22.18
Southern No. 2, sil. 1.75 to 2.25	24.01 to 25.01
Low phos., sil. 1 to 2 per cent, copper free	31.79
Silvery, sil. 8 per cent	35.29
Electric ferrosilicon, 14 to 16 per cent	43.42

Plates.—In the absence of railroad car buying, interest is centered in pending tonnage for the Denver riveted pipe line and various inquiries for oil storage tanks. Demand for plates still lags and prices remain unstable with 2.25c., Chicago, the generally quoted figure in this district.

The mill quotation is 2.25c., Chicago. Jobbers quote 3.10c. for plates out of stock.

Ferroalloys.—Ferromanganese has declined to $105, seaboard, while spiegeleisen is now generally available at $33, seaboard. No sales of consequence are reported.

We quote 80 per cent ferromanganese, $112.56, delivered; 50 per cent ferrosilicon, $75, delivered; spiegeleisen, 18 to 22 per cent, $39.56, delivered.

Structural Material.—The largest fabricating award for the week, 2000 tons for the Lumber Exchange Building, Chicago, went to the Morava Construction Co. Other lettings were small but bring up the total to 4800 tons. Structural shops are still in need of tonnage and are naming exceedingly low figures in bidding on current work. Plain material has declined and is now generally available at 2.25c., Chicago.

The mill quotation on plain material is 2.25c., Chicago. Jobbers quote 3.10c. for plain material out of warehouse.

Bars.—Mills base their hopes for a turn in the steel market on the gradual improvement in demand for soft steel bars. For one local producer, bookings in bar mill products thus far this month show an increase of 50 per cent over the corresponding period in June. The increased value of farm products is expected to have a favorable effect on the implement business and fair-sized specifications from that quarter are looked for next month, when preparations for fall trade get under way. Jobbers continue to feel out the market for bars and other products, but are slow to buy. A Duluth warehouse, however, has closed for 1000 tons, principally bars. Mill prices on soft steel bars have declined to 2.15c., Chicago, and it is hoped that stability will be found at that figure. Bar iron remains at 2.20c., Chicago, and sellers contend that the advance in scrap precludes any further reduction. Rail steel bar mills are also confronted with higher old material prices and have taken no formal action on prices, although occasional shading under 2.10c., Chicago mill is reported.

Mill prices are: Mild steel bars, 2.15c., common bar iron, 2.20c., Chicago; rail steel, 2.10c., Chicago mill.

Jobbers quote 3c. for steel bars out of warehouse. The warehouse quotations on cold-rolled steel bars and shafting are 3.80c. for rounds and 4.30c. for flats, squares and hexagons; 4.15c. for hoops and 3.65c. for bands.

Jobbers quote hard and medium deformed steel bars at 2.35c. to 2.40c., base.

Sheets.—Inquiry is gradually gaining in volume and there is evidence that manufacturing users have exhausted their stocks and must replenish. With the exception of the leading mill, most producers are now quoting 2.70c., base Pittsburgh, on blue annealed; 3.50c. on black, and 4.60c. on galvanized.

Mill quotations are 3.50c. to 3.65c. for No. 28 black, 2.70c. to 2.80c. for No. 10 blue annealed, and 4.60c. to 4.80c. for No. 28 galvanized, all being Pittsburgh prices subject to a freight rate to Chicago of 34c. per 100 lb.

Jobbers quote f.o.b. Chicago: 3.80c. for blue annealed; 4.50c. for black, and 5.50c. for galvanized.

Wire Products.—Bookings show notable improvement during the week, but it is still evident that purchases are largely for current requirements. Both jobbers and manufacturing users are taking more tonnage and the coal mines, which have not been factors in the market for months, are placing orders for small track spikes and electrical wire. There have been no further changes in prices outside of increased softness in wire nails, which can now be bought from some producers at $2.85 per keg. For mill prices see finished iron and steel, f.o.b. Pittsburgh, page 232.

We quote warehouse prices f.o.b. Chicago: No. 6 to No. 9 bright basic wire, $3.70 per 100 lb.; extra for black annealed wire, 15c. per 100 lb.; common wire nails, $3.55 per 100 lb.; cement coated nails, $2.80 per keg.

Rails and Track Supplies.—Demand for both rails and fastenings is showing signs of revival. The Texas & Pacific is inquiring for 20,000 tons of rails and the Terminal Railroad Association of St. Louis for 2000 tons. The St. Louis-San Francisco has placed 7000 kegs of spikes and bolts with a Chicago mill. The Baltimore & Ohio is inquiring for 10,000 kegs of spikes, 5000 kegs of bolts and 150 tons of axles. The Louisville & Nashville is in the market for 12,000 kegs of spikes and 830 kegs of bolts. The Great Northern inquiry for 3000 tons of tie plates, 1000 tons of angle bars and 500 kegs of bolts is still pending. Prices of spikes, bolts and tie plates have given ground and new quotations are given below.

Standard Bessemer and open-hearth rails, $43; light rails, rolled from billets, 2.10c., f.o.b. makers' mill.

Standard railroad spikes, 2.80c. to 3c. mill; track bolts with square nuts, 3.80c. to 4c. mill; steel tie plates, 2.45c., f.o.b. mill; angle bars, 2.75c. f.o.b. mill.

Jobbers quote standard spikes out of warehouse at 3.65c. base, and track bolts, 4.65c. base.

Cast Iron Pipe.—New business is in diminishing volume, but prices appear to be firm at the figures published below. James B. Clow & Sons will furnish 190 tons for Toronto, Ohio, and 120 tons for the Grand Trunk Railroad. The National Cast Iron Pipe Co. will supply 300 tons for the South Park Commissioners, Chicago, 150 tons for Anna, Ill., and 100 tons for Campus, Iowa. Four hundred tons for Winthrop Harbor, Ill., has been awarded to the United States Cast Iron Pipe & Foundry Co. St. Paul has rejected bids on 220 tons of 6-in. Blissfield, Mich., takes figures on 835 tons today.

We quote per net ton, f.o.b. Chicago, as follows: Water pipe, 4-in., $59.20; 6-in. to 12-in., $55.20; over 12-in., $54.20; Class A and gas pipe, $5 extra.

Bolts, Nuts and Rivets.—New business shows little increase, but sellers find encouragement in the receipt of a few orders from the farm implement industry, which has been practically idle. Prices are still soft and on current business 70 and 5 off to 70, 10 and 5 off, Chicago, have been done on large machine bolts. On large rivets, the minimum quotation on contracts is $2.90, Chicago, but on business for early shipment as low as $2.75 has been quoted. Small rivets continue to range from 70 and 5 to 70 and 10 and 5 off Chicago.

Jobbers quote structural rivets, 3.65c.; boiler rivets, 3.85c.; machine bolts up to ⅞ x 4 in., 60 per cent off; larger sizes, 60 off; carriage bolts up to ⅞ x 6 in., 55 off; larger sizes, 55 off; hot pressed nuts, squares and hexagons, tapped, $4 off; blank nuts, $4 off; coach or lag screws, gimlet points, square head, 65 per cent off.

Warehouse Prices.—Local jobbers have reduced prices on most of their finished steel products $2 or more a ton. The new prices will be found under the appropriate paragraphs. Bolts and nuts, and track spikes and bolts remain unchanged.

Reinforcing Bars.—A fair amount of tonnage continues to be placed, but keen competition among sellers has so sharply reduced the margin between the mill and warehouse prices that the problem of covering bare handling and engineering costs is a serious one. It is for this reason that no further general decline in warehouse quotations is expected unless mill prices definitely drop to a lower level. The going range of warehouse material is still 2.35c. to 2.40c., Chicago., although in some instances lower figures have been named. Among fresh projects is the Gray office building, Benton Harbor, Mich., requiring 300 tons. The reinforcing bars for the Sherman Hotel, Chicago, amounting to 300 tons, will be bought Aug. 15. Lettings include:

Abraham Lincoln Hotel building, Springfield, Ill., 600 tons (rail steel) to LaClede Steel Co.

Fridley filtration plant, municipal water works, Minneapolis, 300 tons to C. A. P. Turner Co.

Power plant, Illinois Power & Light Corporation, Springfield, Ill., 200 tons (rail steel) to LaClede Steel Co.

G. A. Butter Hardware Co. building, Milwaukee, 150 tons to American System of Reinforcing.

Illinois State highway work, 150 tons to Olney J. Dean & Co.

Chicago Union Station Co., track slab construction, Chicago, 150 tons to Olney J. Dean & Co.

Marneau apartment building, Milwaukee, 100 tons to American System of Reinforcing.

Missouri State highway work, Ripley County, 100 tons to Olney J. Dean & Co.

Biersdorf Packing Co. plant, Chicago, 125 tons to American System of Reinforcing.

Sawyer Amusement Co. building, Chicago, 105 tons to Olney J. Dean & Co.

Hammond National Bank Building, Hammond, Ind., 200 tons, to Concrete Steel Co.

Pending work includes:

Gray office building, Benton Harbor, Mich., 300 tons.

Union League Club building, Chicago, 100 tons.

Van Buren Street Subway, Chicago, for Illinois Central, 150 tons, general contract awarded to B. W. Construction Co.

Coke.—Demand for foundry coke shows little change for the better and beehive prices are weak and erratic, ranging from $3.75 to $5.50, Connellsville. The freight to Chicago is $4.16. Local by-product foundry coke is unchanged at $10.75, delivered Chicago switching district.

Old Material.—A decline in consumer buying and a concomitant slowing down of trading between dealers has halted the advance in prices and, in the case of heavy melting steel, has caused a slight set-back. The reaction in the market, however, is believed to be only temporary and an early recovery is looked for. The Grand Trunk offers 1400 tons and the Pennsylvania 1000 tons.

We quote delivery in consumers' yards, Chicago and vicinity, all freight and transfer charges paid, as follows:

	Per Gross Ton	
Iron rails	$16.50 to	$17.00
Cast iron car wheels	16.50 to	17.00
Relaying rails, 56 and 60 lb.	26.00 to	27.00
Relaying rails, 65 lb. and heavier	27.00 to	32.00
Forged steel car wheels	17.50 to	18.00
Railroad tires, charging box size	18.00 to	18.50
Railroad leaf springs, cut apart	18.00 to	18.50
Rails for rolling	15.50 to	16.00
Steel rails, less than 3 ft.	17.00 to	17.50
Heavy melting steel	15.25 to	15.75
Frogs, switches and guards cut apart	15.25 to	15.75
Shoveling steel	15.00 to	15.50
Drop forge flashings	10.00 to	10.50
Hydraulic compressed sheets	12.00 to	12.50
Axle turnings	12.00 to	12.50
Steel angle bars	16.00 to	16.50
Steel knuckles and couplers	17.50 to	18.00
Coil springs	19.00 to	19.50
Low phos. punchings	15.00 to	15.50
Machine shop turnings	8.00 to	8.50
Cast borings	10.50 to	11.00
Short shoveling turnings	10.50 to	11.00
Railroad malleable	17.00 to	17.50
Agricultural malleable	16.00 to	16.50
Per Net Ton		
Iron angle and splice bars	16.00 to	16.50
Iron arch bars and transoms	17.00 to	17.50
Iron car axles	23.00 to	23.50
Steel car axles	17.00 to	17.50
No. 1 busheling	11.00 to	11.50
No. 2 busheling	8.00 to	8.50
Pipes and flues	9.00 to	9.50
No. 1 railroad wrought	13.00 to	13.50
No. 2 railroad wrought	13.50 to	14.00
No. 1 machinery cast	17.00 to	17.50
No. 1 railroad cast	16.00 to	16.50
No. 1 agricultural cast	16.00 to	16.50
Locomotive tires, smooth	15.00 to	15.50
Stove plate	14.00 to	14.50
Grate bars	14.50 to	15.00
Brake shoes	14.00 to	14.50

Detroit Scrap Market

DETROIT, July 22.—The automobile production with few exceptions has not necessitated calling on foundries for any increased production in the way of castings. Stove and furnace shops have resumed operations on a normal basis, so that the actual melt in the district is at a high point for the month. Malleable shops are operating on a very low basis with some signs of increases within the next 30 days. Scrap prices are unchanged.

The following prices are quoted on a gross ton basis f.o.b. cars producers' yards, excepting stove plate, No. 1 machinery cast and automobile cast, which are quoted on a net ton basis:

Heavy melting steel	$13.25 to	$14.25
Shoveling steel	13.00 to	14.00
Borings	10.50 to	11.50
Short turnings	10.50 to	11.50
Long turnings	9.50 to	10.25
No. 1 machinery cast	15.00 to	16.00
Automobile cast	18.00 to	19.00
Hydraulic compressed	11.00 to	12.00
Stove plate	13.50 to	14.50
No. 1 busheling	10.00 to	11.00
Sheet clippings	8.00 to	9.00
Flashings	9.50 to	10.50

New York

Steel Orders in Increased Volume—Plates Are Lower

NEW YORK, July 22.—Moderate buying of pig iron has continued, with prices unchanged. The principal purchase was of the Gould Coupler Co., 4000 tons of basic and malleable, and the largest inquiry now pending is 4000 tons of No. 1X and No. 2X for a foundry at Port Chester, N. Y., for delivery in the last quarter. The General Electric Co. is in the market for 1600 tons of high silicon. A feature of the present situation is the scarcity of high silicon iron. The shortage is due in part at least to furnaces avoiding making the more costly iron. The furnaces continue to be very conservative about quoting for fourth quarter. It is believed that sales have been enough to cover the accumulated stocks, but it is doubtful whether present sales are equal to the production. Some further curtailment of production is expected. Adrian furnace will go out about Aug. 1. Low phosphorus iron is coming from England on a basis of $24.50, Eastern seaboard, and high phosphorus from France at $20.50. Some Indian iron has been coming in but reports in regard to it have been grossly exaggerated.

We quote delivered in the New York district as follows, having added to furnace price $2.27 freight from eastern Pennsylvania, $4.91 from Buffalo and $5.44 from Virginia:

East. Pa. No. 2, sil. 1.75 to 2.25	22.77 to 23.27
East. Pa. No. 1X fdy., sil. 2.75 to 3.25	$23.77 to $24.27
East. Pa. No. 2X fdy., sil. 2.25 to 2.75	23.27 to 23.77
Buffalo sil. 1.75 to 2.25	23.91
No 2X Virginia, sil. 2.25 to 2.75	31.44
No. 2 Virginia, sil. 1.75 to 2.25	30.44

Ferroalloys.—Representatives of British producers of ferromanganese were authorized yesterday to sell the alloy at $105, seaboard, thus meeting the quotation of a domestic producer, which cut the price last week. The general market is therefore at $105, seaboard or furnace, and at this level several hundred tons have been sold. There is an inquiry before the market for 500 tons, together with smaller lots. Most of the buying has been for immediate shipment, indicating small stocks in the hands of consumers. The spiegeleisen market has not been active, but there have been sales of a few lots at the regular prices of $34 to $36, furnace, for the higher grade and $33 to $35 for the lower. Business in 50 per cent ferrosilicon is confined to small lots for filling-in requirements and the range of quotations stands at $72 to $75, delivered, depending on the quantity, delivery and the seller.

Cast Iron Pipe.—Although buying has declined to small tonnages, prices are substantially unchanged and makers continue operation on old orders, which are sufficient in most cases to carry them through the next two months. The Department of Water Supply, Gas and Electricity, City of New York, has awarded a contract involving the purchase by the contractor of about 100 tons of water pipe. We quote per net ton, f.o.b. New York, in carload lots, as follows: 6-in. and larger, $60.60 to $61.60; 4-in. and 5-in., $65.60 to $66.60; 3-in., $75.60 to $76.60, with $5 additional for Class A and gas pipe. Inquiries for soil pipe are more numerous than for a number of weeks, but apparently are not for the purpose of increasing stocks which continue low. Buyers are protected against price reductions before July 31. Weakness is still evident, although quotation of 5 points greater discount is not quoted as openly as in the early part of the month. We quote discounts of both Southern and Northern makers, f.o.b. New York, as follows: 40 to 40¾ per cent off list; heavy, 50 to 50¾ per cent off list.

Finished Iron and Steel.—Indications of the past week are that an increasing number of consumers are reaching the end of their stocks or are getting a larger volume of work, steel orders having shown a fairly important gain over the preceding few weeks. One steel company office, handling a variety of products, reports that its sales last week were 60 per cent of what it considers a "normal" volume for this territory, and some of the orders were larger than has been the rule recently, quite a number ranging from 200 to 500 tons, whereas orders in excess of a carload lot were the exception during most of June and the first two weeks of July. Some of the Eastern plate mills have found an increase in both inquiries and orders, and the demand for universal plates has quickened considerably. Sales executives have not permitted themselves to attach undue significance to this slight increase in business; it is believed to be the natural result of the extremely limited buying of the past two months. The belief is entertained that consumption has been going on at a rate greater than production, and if this is true, it naturally follows that replenishment buying must come in greater volume. Slow but gradual improvement is expected to continue during the next month or six weeks. Structural steel awards and inquiries still constitute the most active feature of the market, and the volume of such work being awarded and pending is quite surprising for midsummer. Prices of all steel products are about the same as a week ago, with the possible exception of plates, which are now more freely quoted at 1.80c., Pittsburgh basis. Shapes at 1.95c. to 2c., Pittsburgh, from Eastern mills, and at 2.15c. from Pittsburgh mills constitute one of the price anomalies of the present situation, and of course plates are in the same position, Pittsburgh mills making little effort to get Eastern plate orders because of the much lower prices quoted by Eastern mills.

We quote for mill shipments, New York delivery, as follows: Soft steel bars, 2.49c. to 2.54c.; plates, 2.14c. to 2.24c.; structural shapes, 2.34c. to 2.44c.; bar iron, 2.44c.

Coke.—Standard foundry continues fairly firm, but furnace coke is still weak. Standard foundry is quotable at from $4.75 to $5.25 per ton, while standard furnace ranges from $3.50 to $3.75 per ton, with occasional tonnages available at even less. By-product is unchanged at $10.41, Newark and Jersey City, N. J.

Warehouse Business.—Effective July 17, warehouses in this district, including the leading warehouse interest and foremost independent, reduced prices to conform to a mill basis of 2.25c. per lb., Pittsburgh. Bars are now 3.24c. per lb. base, and plates and shapes, 3.34c. per lb. base, which represents a reduction of $2 per ton from the previous price for shipment from stock. Blue annealed sheets are down $5 per ton to a base price for No. 10 gage of 3.89c. per lb. Black and galvanized sheets also underwent a slight reduction. The minimum quotation is now 4.60c. per lb. base for black and 5.60c. per lb. base for galvanized, a drop of 15c. per 100 lb. Effective about the same date, sellers of cold-rolled shafting reduced quotations 10c. per 100 lb. to 4.15c. per lb. for rounds and 4.75c. per lb. for flats, squares and hexagons. Cold-rolled strip steel is now on a single base of 7c. per lb., regardless of hardness. Shading of prices on bolts and screws continues and the discounts that have appeared occasionally in this market have been established as the regular price by some sellers. As a result, we quote a slightly wider range of prices. Tire steel and toe-calk have been reduced 10c. per 100 lb. in conformity with the new price schedule on bars, shapes and plates. Business shows little or no improvement. Orders are fairly numerous on some products but exceedingly small. We quote prices on page 246.

Old Material.—The undertone of strength that has been recently noted seems to be still confined largely to dealers and brokers. No. 1 heavy melting steel is still being purchased for eastern Pennsylvania consumers at $14.50 to $15.50 per ton, depending upon shipment. It is felt that should western Pennsylvania consumers increase present prices only slightly, heavy melting steel would move from this district to Midland and Wierton. One broker is offering $17 to $17.25 per ton for Midland delivery now, or close to $11 per ton, New York. A few borings and turnings are being shipped to Riddlesburg at $12 per ton. Machine shop turnings are being bought at $12.50 per ton delivered

Phoenixville. Specification pipe purchases continue at $15.50 per ton delivered eastern Pennsylvania.

Buying prices per gross ton New York follow:

Heavy melting steel, yard	$10.25 to 10.75
Heavy melting steel, railroad or equivalent	11.50 to 12.00
Rails for rolling	14.25 to 14.75
Relaying rails, nominal	24.00 to 25.00
Steel car axles	16.00 to 17.00
Iron car axles	23.00 to 24.00
No. 1 railroad wrought	14.50 to 15.00
Forge fire	8.75 to 9.25
No. 1 yard wrought, long	13.50 to 14.00
Cast borings (clean)	8.75 to 9.25
Machine-shop turnings	8.50 to 9.00
Mixed borings and turnings	7.25 to 7.75
Iron and steel pipe (1 in. diam., not under 2 ft. long)	11.25 to 11.75
Stove plate	10.75 to 11.75
Locomotive grate bars	11.50 to 12.50
Malleable cast (railroad)	14.00 to 14.50
Cast iron car wheels	13.50 to 14.00
No. 1 heavy breakable cast	11.75 to 12.25

Prices which dealers in New York and Brooklyn are quoting to local foundries per gross ton follow:

No. 1 machinery cast	$15.00 to $15.50
No. 1 heavy cast (columns, building materials, etc.) cupola size.	13.00 to 13.50
No. 2 cast (radiators, cast boilers, etc.)	12.00 to 12.50

Cincinnati

Sale of Round Tonnage of Basic Confirmed—Coke More Active

CINCINNATI, July 22.—Officials of the Andrews Steel Co. confirm the purchase of over 20,000 tons of basic iron, but seller or price was not divulged. Reports that less than $21, delivered Newport, Ky., was done are persistent. Freight rate from Valley points is $3.65, and from Cleveland $3.28. A sale of 500 tons of malleable was made to an implement manufacturer at Springfield, the order going to a Lake furnace at a reported price of $18.50, furnace. There was considerable activity in silvery irons, consumers in northern Ohio and Michigan having bought round lots. A Michigan melter bought 800 tons for last half, while another bought 500 tons. It is reported that price concessions have been made on silvery irons, but confirmation is lacking. There has been little activity in Southern irons, and the price of $18, Birmingham, stands. In southern Ohio $19.50 is the minimum, with only one interest quoting. Reports of Jackson County spiegeleisen having been offered at $38, furnace, are in circulation, but the one furnace in blast has not indicated its intention to make spiegel in the near future. Several carload sales of ferromanganese have been made at $105, seaboard. There is little inquiry, though foundry operations in the district are improving slightly.

Based on freight rates of $4.05 from Birmingham and $2.27 from Ironton we quote f.o.b. Cincinnati:

Southern fdy., sil. 1.75 to 2.25 (base)	$22.05
Southern fdy., sil. 2.25 to 2.75	22.55
Southern Ohio silvery, 8 per cent	32.77
Southern Ohio fdy., sil. 1.75 to 2.25	21.77
Southern Ohio basic	21.27
Southern Ohio malleable	21.77

Fluorspar.—Demand for fluorspar is confined to carload lots for immediate shipment, and most of the orders are going to the smaller producers at $2 to $3 per ton below the quotations of the large operators. Foreign shipments are reported to be taking care of the trade on the Eastern seaboard. Prices are given on page 233.

Sheets.—A Tennessee manufacturer placed an attractive order for black sheets at 3.40c., a reduction of $2 per ton from the previous low. It is also said that 2.60c. can be done on blue annealed sheets, with reports of 2.55c. having been quoted. Galvanized sheets at 4.50c. have appeared. Reports of nearby makers having reduced prices of automobile body sheets $2 per ton to 5c. appear to be unfounded, as mills deny such quotations. A northern Ohio maker is reported to have quoted auto body sheets at 4.95c., but confirmation is lacking. A better demand for sheets is reported from all districts, and it appears that present prices are proving attractive to consumers, though buying, as a general rule, is not for other than purposes of filling in stocks.

Structural Activity.—The market is quiet. Inquiries are light, and awards for small tonnages. Prices continue attractive to builders, but indications point to the low point having been reached, unless, of course, really drastic cuts in prices of plain material become effective.

Reinforcing Bars.—There were no awards of importance during the past week. New inquiries include several buildings requiring more than 100 tons. These include the Taft Law building for the University of Cincinnati, and the Kentucky Normal School at Murray, Ky., on which bids will be taken shortly. Road work in Ohio and Kentucky is providing a fair tonnage of bars. A notable sale was for 1000 tons for stock to the Ferro-Concrete Construction Co. at Cincinnati. Prices of rail steel bars are firming, though it is still possible to place attractive tonnages at 2c., mill, with some producers holding for 2.10c.

Warehouse Business.—Prices have declined $2 per ton on most products since last week. The demand, however, has increased, and jobbers report business this month considerably ahead of the entire month of June.

Cincinnati jobbers quote: Iron and steel bars, 3.30c.; reinforcing bars, 3.40c.; hoops, 4.35¾c.; bands, 4.05c.; shapes, 3.40c.; plates, 3.40c.; cold-rolled rounds, 4.05c.; cold-rolled flats, squares and hexagons, 4.55c.; open-hearth spring steel, 4.75c. to 5.75c.; No. 10 blue annealed sheets, 3.90c.; No. 28 black sheets, 4.60c.; No. 28 galvanized sheets, 5.75c.; No. 9 annealed wire, 3.30c.; common wire nails, $3.30 per keg base; cement coated nails, $3 per keg.

Finished Materials.—The Louisville & Nashville Railroad placed an order for 500 tons of boiler and tank plate with a Southern mill. An inquiry for 1100 tons of fire box steel has been sent out by a Louisville, Ky., manufacturer. Plate prices are weak, and Eastern mills are quoting below 2c., Pittsburgh, for shipment to Southern points. The general quotation for Cincinnati district points is 2.10c., Pittsburgh, but 2c. has been done and orders can still be placed at this price. At least two Eastern mills have quoted structural shapes in this territory at 2.10c., Pittsburgh, but the larger producers are fairly firm at 2.15c., and have been booking business. Bar prices are being maintained at 2.15c., but as business is light, a test of the market has not been made. There is some talk of 2.50c. having been quoted on hoops and bands, but orders are still being booked at 2.60c. Wire nails are now generally quoted at $2.85 per keg, and the Ironton river rate of 14c. per keg to Cincinnati is being equalized by makers in other districts. Plain wire has been quoted at $2.60 per 100 lb. Quotations of 70 and 10 off are common for machine bolts, and a carload order has been placed at 70, 10 and 5 off.

Coke.—Demand for coke has shown more activity, particularly for foundry grade, but inquiries continue of the carload variety for immediate shipment. There has been no change in prices. Several operators in Wise County and New River fields are putting on more ovens to take care of increasing business.

Connellsville furnace, $3.15; foundry, $4.50; New River foundry, $8.50; Wise County furnace, $3.75; foundry, $4.50; by-product foundry, $7.50; Connellsville basis.

Old Material.—Locally the scrap market is quiet, but dealers report sales in other markets, particularly Youngstown and Pittsburgh at advanced prices. Steel plants in this district are holding up shipments for the rest of the month, but dealers are more optimistic.

We quote dealers' buying prices, f.o.b. cars, Cincinnati:

Per Gross Ton	
Heavy melting steel	$13.00 to $13.50
Scrap rails for melting	12.00 to 12.50
Short rails	17.00 to 17.50
Relaying rails	28.50 to 29.00
Rails for rolling	14.00 to 14.50
Old car wheels	13.00 to 13.50
No. 1 locomotive tires	14.00 to 14.50
Railroad malleable	15.50 to 16.00
Agricultural malleable	14.00 to 14.50
Loose sheet clippings	8.50 to 9.00
Champion bundled sheets	10.50 to 11.00
Per Net Ton	
Cast iron borings	9.50 to 10.00
Machine shop turnings	8.50 to 9.00
No. 1 machinery cast	18.00 to 18.50
No. 1 railroad cast	14.50 to 15.00
Iron axles	21.00 to 21.50
No. 1 railroad wrought	10.50 to 11.00
Pipes and flues	7.50 to 8.00
No. 1 busheling	9.50 to 10.00
Mixed busheling	7.00 to 7.50
Burnt cast	10.50 to 11.00
Stove plate	10.50 to 11.00
Brake shoes	11.50 to 12.00

Buffalo

Pig Iron Prices Fairly Firm—Heavy Melting Steel Price Advances

BUFFALO, July 22.—The principal transaction of the week was the closing for about 4000 tons by the Gould Coupler Co. This tonnage, according to one report, was all basic and was split 1000 tons to one furnace and 3000 tons to another. Inquiry amounted to 5000 to 7000 tons altogether, including a malleable inquiry for 2000 to 3000 tons from Brantford, Conn. A boiler concern from the eastern part of the State seeks 1000 tons of foundry and the rest was scattering inquiry. Local makers say they have not found it necessary to go below $19 on ordinary business this week, and in some instances the differentials are being obtained. One concern is quoting $19 on 1.75 to 2.25 silicon foundry and the same on the next grade, while the 2.75 to 3.25 silicon foundry is bringing $19.50. Furnace operation is the lowest in weeks with only six stacks in blast, due to the shutting down of an additional Wickwire-Spencer stack. Furnace operation is now as follows: Bethlehem, two; Donner, one; Rogers-Brown, one; Hanna, two.

We quote f.o.b., gross ton Buffalo, as follows:

No. 2 plain, sil. 1.75 to 2.25	$18.50 to $19.00
No. 1 foundry, sil. 2.75 to 3.25	$19.00 to 19.50
No. 2 foundry, sil. 2.25 to 2.75	19.00
Basic	19.00
Malleable	19.00
Lake Superior charcoal	29.28

Finished Iron and Steel.—Preparations are being made by the Bethlehem Steel Co.'s Lackawanna plant and by the Donner Steel Co. for slightly increased operation and this, taken along with the increased buying of old material, is believed to indicate a better trend in the local steel market. The Wickwire-Spencer company is still operating 50 per cent of capacity and Seneca Iron & Steel Co. about the same. Demand for all kinds of wire is considerably better, and while reinforcing mesh for roadwork is not showing heavy booking, comparatively good orders are being booked by makers. Bar, shape and plate business shows about the same number of orders as last week, without any falling off. Shaded prices are the rule on desirable business with 2.15c. to 2.20c. being quoted on all three. Sheet business is fair with the price for black around 3.60c. and the price for galvanized around 4.70c. to 4.75c. Pipe business is fair and fabricators of structural shapes report an improved demand. Sheet piling is off and little demand exists for bolts and nuts. Canadian business is dead, with the implements makers very quiet. The American Bridge Co. is reported to have taken the 2000-ton fabricating job for the Utica Gas & Electric Co. building.

Steel bars, 3.40c.; iron bars, 3.35c.; reinforcing bars, 3.40c.; structural shapes, 3.50c.; plates, 3.50c.; No. 10 blue sheets, 4.05c.; No. 28 black sheets, 4.75c.; No. 28 galvanized sheets, 5.85c.; bands, 4.15c.; hoops, 4.50c.; cold finished rounds, 4.30c.; cold finished shapes, 4.80c.

Old Material.—The feature of this week's market is the fact that one local dealer is offering $16.50 for No. 1 grade heavy melting steel, for shipment to a local mill. The dealer involved is authority for the statement that it is impossible to buy this grade of heavy melting steel under $16. Youngstown is offering $18 for heavy melting steel, which is the equivalent of $15.50 here. Heavy melting steel of not strictly No. 1 grade can be bought for $14.50 to $15. A stronger demand exists for turnings and borings and Youngstown and Cleveland are offering $14 to $14.50 for turnings, while the same price is being paid for cast iron borings and short shoveling turnings. Stove plate is said to be strong at $16, with one large concern actively seeking this material. No. 1 cast is said to have strengthened with $17 to $18 having been paid. Railroad companies are said to have obtained better than $17.50 last month. Malleable scrap is bringing $17 to $18 and a car of knuckles and couplings sold during the week for $18.25. Mill stocks and stocks in dealers' hands are low, and there is indication that the market is about to open up.

We quote f.o.b., gross ton, Buffalo, as follows:

Heavy melting steel	$15.00 to $16.00
Low phos., 0.04 and under	17.00 to 18.00
No. 1 railroad wrought	12.50 to 13.00
Car wheels	17.50 to 18.00
Machine shop turnings	11.00 to 11.50
Cast iron borings	12.00 to 12.50
No. 1 busheling	12.00 to 13.00
Stove plate	15.50 to 16.00
Grate bars	14.50 to 15.00
Bundled sheets	8.00 to 9.00
Hydraulic compressed	14.00 to 14.50
Railroad malleable	17.00 to 18.00
No. 1 machinery cast	17.00 to 18.00

Boston

Small Tonnage of Pig Iron Moved at Unchanged Prices

BOSTON, July 22.—Buying of pig iron the past week was again confined to small tonnages, aggregate sales not exceeding 3000 tons. Buffalo and New York State furnaces secured the bulk of the business, which was taken at unchanged prices. Buying is fairly evenly divided between No. 2X and No. 1X, the supply of which is dwindling rapidly. No. 2 plain is in good supply, but there is comparatively little call for this grade in New England, many foundries using it before the war having gone on No. 1X and No. 2X. Going business is for third quarter delivery, furnaces being reluctant to accept fourth quarter tonnages. Two India furnaces are actively competing for business, offering iron on a delivered basis about $1 a ton under domestic. They have placed several thousand tons within the past month. The largest inquiry in the market is for 600 tons No. 2X, August, September and October delivery, wanted by a Vermont foundry.

We quote delivered prices on the basis of the latest reported sales as follows, having added $3.65 freight from eastern Pennsylvania, $4.91 from Buffalo, $5.92 from Virginia and $9.60 from Alabama:

East. Penn., sil. 1.75 to 2.25	23.65 to 25.15
East. Penn., sil. 2.25 to 2.75	$25.15 to $25.65
Buffalo, sil. 2.25 to 2.75	23.91 to 24.41
Buffalo, sil. 1.75 to 2.25	23.91
Virginia, sil. 2.25 to 2.75	31.42 to 32.42
Virginia, sil. 1.75 to 2.25	30.92 to 31.92
Alabama, sil. 2.25 to 2.75	30.10 to 31.10
Alabama, sil. 1.75 to 2.25	29.60 to 30.60

Warehouse Business.—Competition among warehouses for business in this territory is growing keener. A further readjustment of prices, the second within a month, is the result. Soft steel bars, flats, concrete bars, channels and tees under 3 in., plates and refined iron bars have been cut an additional 10c. per 100 lb., making the total cut within a month 25c. Steel bands and hoop steel are down another 10c., making the total cut 30c. In addition, cold-rolled steel, tees and zees, as well as structural steel, have dropped 10c. Otherwise prices remain on the June 23 schedule. Steel mill warehouses are carrying sizable and well assorted stocks. The position of the independent interests is quite the reverse. Local warehouse prices follow:

Soft steel bars, $3.26½ base per 100 lb.; flats, $4.15; concrete bars, $3.51½ to $3.64; structural steel, $3.36½; tire steel, $4.50 to $4.75; open-hearth spring steel, $5 to $10; crucible spring steel, $12; steel bands, $4.01½ to $5; hoop steel, $5.50 to $6; cold rolled steel, $4.15 to $4.65; toe calk steel, $6; refined iron bars, $3.26½; best refined bars, $4.60; Wayne, $5.50; Norway, $6.60 to $7.10; plates, ¼-in. and heavier, $3.36½; No. 10 blue annealed sheets, $4.51½.

Coke.—The recent reduction in by-product foundry coke to $11.50, delivered, made by the Providence Gas Co. and the New England Coal & Coke Co. has had little influence on the movement of fuel from ovens. Specifications against last half contracts are still comparatively small because of the inactivity of the important coke consumers. New Jersey by-product foundry coke makers, having placed some business in this territory, apparently have withdrawn from the market.

Old Material.—Sentiment in the old material market remains optimistic, but actual business is no better. Sales the past week included a few hundred tons of heavy melting steel for eastern Pennsylvania shipment, a few distress cars of pipe at $10.50 to $11, bun-

dled skeleton at $7.50 to $8, forge fire scrap at $8 to $8.50, and steel turnings at $7.75 to $8.50. Because of the inactivity of metal working shops, turnings are scarce and going prices represent an advance of 25c. to 50c. a ton. Rails for rerolling also are scarce and higher. The Boston & Maine Railroad today will dispose of 67 cars of miscellaneous material.

The following prices are for gross ton lots delivered consuming points:

No. 1 machinery cast	$19.50 to $20.00
No. 2 machinery cast	16.50 to 17.00
Stove plates	14.50 to 15.00
Railroad malleable	16.50 to 17.00

The following prices are offered per gross ton lots, f.o.b. Boston rate shipping points:

No. 1 heavy melting steel	$10.50 to $11.75
No. 1 railroad wrought	12.50 to 13.00
No. 1 yard wrought	11.50 to 12.00
Wrought pipe (1-in. in diam., over 2 ft. long)	10.50 to 11.00
Machine shop turnings	7.75 to 8.50
Cast iron borings, chemical	9.00 to 9.50
Cast iron borings, rolling mill	8.00 to 8.50
Blast furnace borings and turnings	7.00 to 7.50
Forged scrap and bundled skeleton	7.50 to 8.50
Shafting	16.50 to 17.00
Street car axles	16.00 to 16.50
Rails for rolling	13.00 to 13.50

Birmingham

Hoped for Increase in Pig Iron Buying Does Not Come

BIRMINGHAM, ALA., July 22.—Expectations as to increased demand for pig iron have not been realized in this district and furnace interests are manifesting but a shade more optimism than has obtained since the let-up of the little flurry in buying. Quotations are given at from $18 to $18.50 per ton, No. 2 foundry, 1.75 to 2.25 per cent silicon content, though sales have been made under these prices. Holding out against what appears the inevitable, the tentative program announced heretofore, curtailment where there is not buying equal to the make is being delayed just as much as possible. Some few orders for soil pipe and fittings developed during the past week and two or three of the manufacturers bought a little iron, a few 1000-tons orders being heard of, but it is evident that no general improvement is yet starting in nor will there be a change soon in the hand-to-mouth plan of buying. Deliveries are still steady, but curtailment is noted in raw material supplies, everything being done to cut down the costs that go into the output of the blast furnaces. The Alabama Co. has readjusted the wages of employees around 10 per cent, following the lead of the Woodward Iron Co. The Alabama Co. has one blast furnace in operation and has orders on hand which will warrant steady operation of furnace through the quarter, with some little additional business coming in. This company is maintaining the $18.50 per ton price. Practically all of the business which was booked recently, with the exception of 12,000 to 15,000 tons, which is being shipped to Louisville and other places, was purchased by Southern melters. Southern furnace interests declare that iron sold under $18 carries no profit. Transportation companies of this district, feeling the effect of receding business, are curtailing service, keeping up with what traffic is offered.

We quote per gross ton, f.o.b. Birmingham district furnace as follows:

No. 2 foundry, 1.75 to 2.25 sil.	18.00 to 18.50
No. 1 foundry, 2.25 to 2.75 sil.	$18.50 to $19.50
Basic	18.50 to 19.00
Charcoal, warm blast	31.00

Steel.—Changes in the steel production in the Birmingham district are slight and are brought about by varying activities in certain departments or mills, one week the rolling mill having less to do, the next bars and others shapes running lightly. The rail mill is operating steadily, old contracts being filled. Wire and nails market is not very active and warehouse well supplied. Steel bars are quoted at 2.30c. to 2.35c. Birmingham. Operation of plants here are about 75 per cent, independent plants about 50 per cent and Steel Corporation around 85.

Coke.—Coke quotations are weak, ranging from $5 to $5.50 per ton. Production was curtailed the first of the month, both by-product and bee-hive ovens being closed. As soon as more blast furnaces are blown out further curtailment will take place.

Scrap.—The scrap iron and steel market here is practically nil. A scarcity is still reported in No. 1 cast but quotations for that product show no change. Little old material is moving throughout the Southern territory on old contracts.

We quote per gross ton f.o.b. Birmingham district yards as follows:

Cast iron borings, chemical	$15.00 to $16.00
Heavy melting steel	11.00 to 12.00
Railroad wrought	10.00 to 11.00
Steel axles	17.00 to 18.00
Iron axles	19.00 to 19.50
Steel rails	11.00 to 12.00
No. 1 cast	15.00 to 16.00
Tram car wheels	15.00 to 16.00
Car wheels	14.00 to 15.00
Stove plate	14.00 to 15.00
Machine shop turnings	6.00 to 7.00
Cast iron borings	8.00 to 9.00
Rails for rolling	15.00 to 16.00

St. Louis

Pig Iron Market Shows Some Indications of More Firmness

ST. LOUIS, July 22.—A slight improvement in the buying of pig iron was reported during the last week. This is believed to be due to the fact that some melters regard the present low prices as attractive and at bottom and are willing to buy for the future, although they are still conservative in anticipating their requirements. Reports of curtailment of production of pig iron have also caused a strengthening of the situation. Chicago makers continue to quote lower prices in this territory than for the Chicago district, and there are reports of sales as low as $18, f.o.b. there. The market may be said to be $18.50 to $19, as there has been a slight stiffening. The St. Louis Coke & Iron Co. and the Southern makers have not changed prices. All quotations are nominal. The local maker sold 1000 tons of basic to a melter in the district and 600 tons of malleable and foundry to a local melter, in addition to 1400 tons of foundry iron in lots of carload up to 300 tons for prompt shipment. A large Southern interest sold 1300 tons to various job foundries for water and rail shipment over the third quarter. Chicago interests sold 150 to 200 tons to an Indiana melter. The largest inquiry before the market is for 4000 to 5000 tons of basic for an East Side melter for delivery over the next 60 to 90 days.

We quote delivered consumers' yards, St. Louis, as follows, having added to furnace prices $2.16 freight from Chicago, $3.28 from Florence and Sheffield (rail and water), $5.17 from Birmingham, all rail, and 31c. average switching charge from Granite City:

Northern fdy., sil. 1.75 to 2.25	$20.66 to $21.16
Northern malleable, sil. 1.75 to 2.25	20.66 to 21.16
Basic	20.66 to 21.16
Southern fdy., sil. 1.75 to 2.25 (rail)	23.17
Southern fdy., sil. 1.75 to 2.25 (rail and water)	21.28
Granite City iron, sil. 1.75 to 2.25	20.81 to 21.31

Coke.—With the prospect of higher prices for domestic coke on Aug. 1, dealers are beginning to buy stocks of this grade, but there is no heavy buying as yet. Foundry coke is in only fair demand.

Finished Iron and Steel.—With the exception of a few hundred tons of reinforcing bars, there was hardly any business placed last week. The order for 200 tons of reinforcing bars for the Illinois Power Co., Springfield, Ill., went to the Laclede Steel Co., which also got the contract for 100 tons for the police garage here. Railroad buying is almost nothing. Warehouses are buying sparingly.

For stock out of warehouse we quote: Soft steel bars, 3.35c. per lb.; iron bars, 3.35c.; structural shapes, 3.45c.; tank plates, 3.45c.; No. 10 blue annealed sheets, 4.10c.; No. 28 black sheets, cold-rolled one pass, 5c.; cold rolled rounds, shafting and screw stock, 4.15c.; structural rivets, 3.90c.; boiler rivets, 4.10c.; tank rivets, ⅞-in. and smaller, 60 per cent off list; machine bolts, 55 and 5 per cent; carriage bolts, 40-5 per cent; lag screws, 60 and 5 per cent; hot pressed nuts, squares or hexagons, blank or tapped, $3.50 off list.

Old Material.—The market for old material continues firm, and prices of specialties in demand by steel mills are higher. There is no buying of rolling mill grades. Dealers are competing keenly for material. Very little material is coming in from the country yards, and railroad offerings are light. The St. Louis & San Francisco list of 500 tons closed yesterday, and there are no new lists of consequence before the market.

We quote dealers' prices f.o.b. consumers' works, St. Louis industrial district and dealers' yards, as follows:

Per Gross Ton	
Iron rails	$12.00 to $12.50
Rails for rolling	16.00 to 16.50
Steel rails less than 3 ft.	17.00 to 17.50
Relaying rails, 60 lb. and under	25.00 to 26.00
Relaying rails, 70 lb. and over	32.50 to 33.50
Cast iron car wheels	15.50 to 16.00
Heavy melting steel	14.00 to 14.50
Heavy shoveling steel	13.75 to 14.25
Frogs, switches and guards cut apart	15.50 to 16.00
Railroad springs	18.50 to 19.00
Heavy axles and tire turnings	11.00 to 11.50
No. 1 locomotive tires	14.50 to 15.00
Per Net Ton	
Steel angle bars	14.00 to 14.50
Steel car axles	17.00 to 17.50
Iron car axles	22.00 to 22.50
Wrought iron bars and transoms	16.50 to 17.00
No. 1 railroad wrought	11.50 to 12.00
No. 2 railroad wrought	12.50 to 13.00
Cast iron borings	9.00 to 9.50
No. 1 busheling	11.00 to 11.50
No. 1 railroad cast	16.00 to 16.50
No. 1 machinery cast	16.50 to 17.00
Railroad malleable	12.50 to 13.00
Machine shop turnings	6.00 to 6.50
Champion bundled sheets	7.50 to 8.00

Cleveland

Increased Demand for Bars—Sentiment in Market Improves

CLEVELAND, July 22.—Several mills report considerable improvement in the demand for finished steel. The increase in the demand is more pronounced in steel bars, for which several 100-ton lots and a few large lots were placed during the week. In plates there is increased demand for small lots. Sentiment in the trade has improved. Operations by manufacturing plants do not appear to have increased and the larger demand seems to be due to orders for filling in stocks which have become very low. In the case of steel bars a number of consumers that purchased fair sized lots during the week have been holding off for some time in unsuccessful attempt to break the 2.15c. price. In the structural field, activity continues light, although several small contracts were placed during the week. The Louisville & Nashville Railroad purchased 500 tons of plates and there is a new inquiry for oil tank work requiring 250 tons. The Lima Locomotive Works has taken five switch engines for the New York Central Railroad requiring 300 tons of plates. The price situation shows little change. Steel bars and structural material are firm at 2.15c., but 2c. on plates has become more common, although some of the mills are making carload sales at 2.15c. Hot-rolled strip steel continues weak and irregular. A price as low as 2.15c. is reported on strip wider than 6 in., which meets the competition of plate mills. Strip narrower than 6 in. is held at around 2.40c. and hoops at 2.65c.

Jobbers quote steel bars, 3.21c.; plates and structural shapes, 3.31c.; No. 28 black sheets, 4.45c.; No. 28 galvanized sheets, 5.55c.; No. 10 blue annealed sheets, 3.55c. to 3.76c.; cold-rolled rounds, 4.10c.; flats, squares and hexagons, 4.60c.; hoops and bands, 1 in. and wider and 20 gage or heavier, 3.96c.; narrower than 1 in. or lighter than No. 20 gage, 4.46c.; No. 9 annealed wire, $3.30 per 100 lb.; No. 9 galvanized wire, $3.75 per 100 lb.; common wire nails, $3.40 base per 100 lb.

Pig Iron.—The market quieted down materially during the week and sales were confined to small lots. However, inquiry is slightly better than a week ago and includes a few lots in excess of 1000 tons. Most of the large buyers are under cover and some of the small consumers who have not yet placed third quarter contracts are buying car lots as needed. A northern Ohio steel plant is in the market for 5000 tons of basic iron, this being the first inquiry for steel making iron from a consumer that has reached this market in several weeks. Prices show no change. In Cleveland foundry and malleable iron are holding firmly at $20, furnace, for local delivery, and for outside shipment $19 is a common quotation, although this is being shaded for shipment into competitive territories where Cleveland furnaces are at a disadvantage in freight rates. In the Valley district $19 is the more general price, although some producers are asking $19.50. Shipping orders show a fair gain over June.

Quotations below, except on basic and low phosphorus iron, are delivered Cleveland, and for local iron include a 50c. switching charge. Ohio silvery and Southern iron prices are based on a $3.02 freight rate from Jackson and $6 rate from Birmingham:

Basic, Valley furnace	$19.00
N'th'n No. 2 fdy., sil. 1.75 to 2.25	20.50
Southern fdy., sil. 1.75 to 2.25	24.00
Malleable	20.50
Ohio silvery, 8 per cent	33.52
Stand. low phos., Valley furnace	$27.00 to 27.50

Iron Ore.—With only 131 furnaces consuming Lake Superior ore in blast July 1 consumption of lake ore decreased 1,037,254 tons in June, or nearly as much as in May, when the reduction was 1,051,398 tons. Consumption during June was 2,793,203 tons as compared with 3,830,457 tons in May and 5,816,139 tons in June last year. The consumption last month was the lowest in any month since August, 1922, when the amount consumed was 2,589,251 tons. Ore on hand at furnaces and Lake Erie docks July 1 amounted to 26,409,713 tons as compared with 21,607,619 tons on June 1 and 22,800,253 tons on July 1 last year.

Bolts, Nuts and Rivets.—Some of the bolt and nut manufacturers report a slight improvement in small orders. Prices are still irregular, with concessions of 10 per cent from the regular quotation of 60 and 20 per cent off list for large machine bolts. There is still weakness in the rivet market with concessions of from $1 to $2 a ton on large rivets.

Sheets.—Some of the mills that have been attempting to get higher prices have settled down to 3.50c. for black sheets and 4.60c. for galvanized sheets, which are now the common market prices. Blue annealed sheets range from 2.70c. to 2.75c. The demand continues light with buying confined to small lots and unless there is improvement a curtailment in present production will be necessary.

Reinforcing Bars.—Considerable new work is pending. Bids have been taken for 300 tons for a chemical house for the Baldwin Reservoir, Cleveland, and a warehouse for the Bailey Co. will require 250 tons. Soft steel bars are firm at 2.15c. While 2c. is the common quotation on rail steel bars, this can be shaded about $2 a ton for a desirable order.

Old Material.—There is no consumer demand locally, but the market has become more active owing to outside sales to dealers and speculative buying. Prices have further advanced 25c. to $1 a ton on most grades. Heavy melting steel scrap has been marked up 75c. or more a ton and flashings have jumped $3. Production of this grade is very light at present owing to the limited operation of forge shops and one sale was made during the week at $14 and another at $14.85. Sales of borings and turnings and compressed steel scrap are reported at $13.50 and heavy melting steel at $16, although dealers have unsuccessfully attempted to sell heavy melting steel scrap to local mills at that price. Recent demand in the Valley district appears to have been satisfied, as heavy melting steel has been offered at $18 in the Valley district without takers.

We quote dealers' prices f.o.b. Cleveland per gross ton:

Heavy melting steel	$15.50 to $16.00
Rails for rolling	16.00 to 16.25
Rails under 3 ft.	16.25 to 16.75
Low phosphorus melting	17.50 to 17.75
Cast iron borings	13.50 to 13.75
Machine shop turnings	13.00 to 13.25
Mixed borings and short turnings	13.25 to 13.50
Compressed sheet steel	13.50 to 13.75
Railroad wrought	13.00 to 13.50
Railroad malleable	17.50 to 18.00
Light bundled sheet stampings	12.00 to 12.50
Steel axle turnings	13.50 to 14.00
No. 1 cast	20.00 to 20.50
No. 1 busheling	13.00 to 13.25
Drop forge flashings	13.50 to 14.00
Railroad grate bars	13.75 to 14.00
Stove plate	13.75 to 14.00
Pipes and flues	11.50 to 12.00

Philadelphia

Appreciable Gain in Orders for Finished Steel Products

PHILADELPHIA, July 22.—An appreciable gain in orders for finished steel products is reported by all mills, without exception. The best estimates obtainable are that orders during the past week have been at a rate equal to about 50 to 60 per cent of the capacity of the mills, and while this leaves much to be desired, it is so much better than the volume of business put on the books during May and June as to bring about a spirit of optimism that has been missing in steel trade circles for the past few months. The rate of acceleration of steel buying is not expected to be rapid; rather the view is that there will be a steady but slow improvement from now on, but that no large increase in demand will come before late August or early September.

Outstanding in the list of finished steel products favorably affected in the rise of orders is structural steel, the award of 24,400 tons of fabricated material to the American Bridge Co. for the Philadelphia-Camden bridge taking precedence over anything that has been done in this district in many months. Other work pending here, which may be let shortly, includes 10,200 tons for subway work, 8300 tons for a power plant for the Philadelphia Electric Co., 3500 tons for two apartment buildings and 4300 tons for a club house for the Penn Athletic Club. The improvement in buying, while most conspicuous in structural steel, has extended to bars, plates, sheets, hot and cold-rolled strip steel. Tin plate buying has shown no particular increase.

Steel companies find that not only have their customers, in a good many instances, reached the end of their stocks, but some manufacturing consumers have received larger orders for the products they make and consequently have been obliged to increase their orders for raw materials. Eastern plate mills, which have been operating at a low rate for months, have benefited proportionately with other makers of steel.

Pig Iron.—While inquiries and orders for pig iron are more numerous than during the first two weeks of July, the market continues on the whole rather dull. Prices show no material change, except perhaps there is less inclination among furnaces to make concessions. On foundry iron the minimum today is $20, furnace, for No. 2 plain, and this price is probably not available in all instances, more common quotations being $20.50 for the base grade, 1.75 to 2.25 per cent silicon, and $21, furnace, for the No. 2 X. A sale of 500 tons of No. 2 X at $21, furnace, is reported by one company. Virginia foundry iron is offered at $23, furnace, but the freight rate of $5.17 per ton to Philadelphia rate points makes the delivered price so much higher than eastern Pennsylvania iron costs that practically no sales of Virginia iron are being made in this immediate territory. The only basic iron inquiry is for 1000 tons, on which a furnace company quoted $20 at furnace. As the market has not recently been tested in an important way it is not certain what might be quoted on a large basic tonnage.

The following quotations are, with the exception of those on low phosphorus iron, for delivery at Philadelphia and include freight rates varying from 76c. to $1.63 per gross ton:

East. Pa. No. 2 plain, 1.75 to 2.25 sil.	$20.76 to $22.13
East. Pa. No. 2X, 2.25 to 2.75 sil.	21.26 to 22.63
East. Pa. No. 1X	21.76 to 23.13
Virginia No. 2 plain, 1.75 to 2.25 sil.	28.17 to 28.67
Virginia No. 2X, 2.25 to 2.75 sil.	28.67 to 29.17
Basic delivered eastern Pa.	20.00 to 21.00
Gray forge	21.00 to 22.00
Malleable	22.00 to 22.50
Standard low phos. (f.o.b. furnace)	24.00 to 25.00
Copper bearing low phos. (f.o.b. furnace)	24.00 to 25.00

Ferroalloys.—The announcement in THE IRON AGE of July 17 that a domestic maker of ferromanganese had offered ferromanganese at $105, furnace, resulted in a reduction by British makers from $107.50 to $105, seaboard, and the leading domestic producer will undoubtedly quote the same price. A very moderate amount of business is being done.

Plates.—Eastern plate mills have experienced a better demand for their product in the past week than at any time in the past few months. The increase in orders is not large, but buying is considerably better than that of June and the first two weeks of July. Prices are weak, especially on the larger lots. Quotations range from 1.80c. to 1.90c., Pittsburgh, but it is reported that orders have been taken below 1.80c. The fact that one or two mills have refused to accept orders tendered at 1.75c., Pittsburgh, is an indication, however, that mills are less inclined than heretofore to make concessions readily. The Pennsylvania Railroad is in the market for 500 to 1000 tons, but most of the orders and inquiries are for much smaller lots. Mill operations have been increased slightly.

Structural Material.—The American Bridge Co.'s bid of $3,305,500 on 24,400 tons of fabricated steel for the Philadelphia-Camden bridge approaches was low and its offer was accepted by the Delaware River Bridge Commissioner. There were only two other bids, Bethlehem Steel Co. and the McClintic-Marshall Co. Fully 26,000 tons in several of the larger projects pending here will probably be decided upon soon. Local fabricators have been getting a fair amount of new work, and buying of structural shapes from Eastern mills has shown a gain. Eastern mills are operating at 65 per cent or better and open-hearth capacity will be added shortly in one or two mills. Prices continue to show a variation, but miscellaneous small lots are being quoted at 2c. to 2.15c., Pittsburgh. On attractive lots of large size, Eastern mills have gone below 2c., Pittsburgh, but the betterment in business is increasing their determination not to offer further concessions.

Bars.—The current demand for bars is showing a slow but steady gain. Looking back over sales records for the month, most of the selling offices find that the tonnage booked since July 1 has been at a rate nearly double that of June, but the June rate, of course, was exceedingly low.

Sheets.—There has been a gain in orders for sheets, but prices are weak. However, some of the extremely low prices recently quoted are said to be less frequent. Galvanized sheets are obtainable from nearly all mills at 4.60c., Pittsburgh, black sheets at 3.50c. and blue annealed sheets at 2.70c.

Old Material.—Except for No. 1 cast scrap, which is weaker because of a lack of buyers, all grades of old material are quoted at the prices shown a week ago. The undertone of the market continues firm, but buying has not been in sufficient volume to accelerate the advance which has been continuous during the past several weeks.

We quote for delivery at consuming points in this district as follows:

No. 1 heavy melting steel	$15.50 to $16.00
Scrap rails	15.50 to 16.00
Steel rails for rolling	17.50 to 18.00
No. 1 low phos., heavy 0.04 and under	19.00 to 20.00
Couplers and knuckles	19.50 to 20.00
Cast-iron car wheels	17.50 to 18.00
Rolled steel wheels	19.50 to 20.00
No. 1 railroad wrought	18.00 to 18.50
No. 1 yard wrought	16.00 to 16.50
No. 1 forge fire	13.50 to 14.00
Bundled sheets (for steel works)	13.00 to 13.50
Mixed borings and turnings (for blast furnace use)	11.00 to 11.50
Machine shop turnings (for steel works use)	13.00 to 13.50
Machine shop turnings (for rolling mill use)	13.00 to 13.50
Heavy axle turnings (or equivalent)	15.50 to 16.00
Cast borings (for steel works and rolling mills)	13.50 to 14.00
Cast borings (for chemical plants)	14.00 to 14.50
No. 1 cast	17.00 to 18.00
Heavy breakable cast (for steel plants)	16.00 to 16.50
Railroad grate bars	14.50 to 15.00
Stove plate (for steel plant use)	14.50 to 15.00
Wrought iron and soft steel pipes and tubes (new specifications)	15.50 to 16.00
Shafting	23.50 to 24.50
Steel axles	21.00 to 22.00

FABRICATED STEEL BUSINESS

Week's Awards Total Close to 50,000 Tons, Including 24,400-Ton Bridge Work

The award of 24,400 tons of fabricated steel to the American Bridge Co. for the Philadelphia-Camden bridge approaches is the outstanding structural job of the last few months. Including this project, the week's awards reached 49,594 tons, as reported to THE IRON AGE. A bridge in Oregon accounts for 6000 tons. New work totals less than 17,000 tons, but a good many projects of size listed in previous weeks are still pending and may be let shortly.

Delaware River Bridge Commission, Philadelphia, opened bids July 16 on 24,400 tons for approaches to Philadelphia-Camden bridge. American Bridge Co.'s bid of $3,305,500 was low; Bethlehem Steel Co.'s bid was $3,376,570, and McClintic-Marshall Co.'s bid was $3,672,845. The order has been formally awarded to the American Bridge Co.

U. S. Mortgage & Trust Co., building at Broadway and Seventy-third Street, New York, 500 tons, to Harris Structural Steel Co.

Norfolk & Western Railroad, freight house at Bluefield, W. Va.-Va., 250 tons, to an unnamed fabricator.

Southern Railway, shops at Spartanburg, S. C., 1500 tons, to Virginia Bridge & Iron Co.

Hotel Dennis, Atlantic City, N. J., addition, 1600 tons, to Bethlehem Steel Co.

State Hospital, Morris Plains, N. J., 700 tons, to American Bridge Co.

Hay Foundry & Iron Works, 1000 tons of trusses and heavy columns for the City Market, New York, sub-let to McClintic-Marshall Co.

Chateaugay Ore & Iron Co., work at Lyon Mountain, N. Y., 1300 tons, to Bethlehem Fabricators, Inc.

First National Bank, Blairsville, Pa., 190 tons, to Jones & Laughlin Steel Corporation.

War Department, United States, three lift bridges over the Chesapeake and Delaware Canal, Maryland and Delaware, 3100 tons, to Phoenix Bridge Co.

Norfolk & Western Railroad, two bridges, 400 tons, to Virginia Bridge & Iron Co.

City of New York, Public School No. 173, 950 tons, to Hinkle Iron Works.

High school building, Trenton, N. J., 500 tons, to American Bridge Co.

Power plant, Devon, Conn., alterations, 300 tons, to American Bridge Co.

Apartment building, Lexington Avenue and Seventy-third Street, New York, 650 tons, to Paterson Bridge Co.

Mercantile building, Brown Place at 132nd Street, New York, 1000 tons, to Hedden Iron Construction Co.

Cheshire Lime Co., trestle in Massachusetts, 150 tons, to Hedden Iron Construction Co.

Building at Hudson Boulevard and Gates Avenue, Jersey City, N. J., 250 tons, to Fagan Iron Works.

Church and school building, New York, 300 tons, to Bigelow & Nichols.

Ahlstrom-Enholm Co., manufacturing plant at Neponsit, Boston, 120 tons, to Jones-Smith Co.

Fitzgibbon Boiler Works, Oswego, N. Y., addition, 100 tons, to Bancroft-Jones Steel Corporation.

Kentucky State highway bridges, 315 tons, to Vincennes Bridge Co.

Third National Bank Building, Dayton, Ohio, 1500 tons, to McClintic-Marshall Co.

Lumber Exchange Building, Chicago, 2000 tons, to Morava Construction Co.

Southern California Telephone Co., West Wilshire office building, Los Angeles, 839 tons, to Baker Iron Works.

University of Chicago, theological buildings, Chicago, 380 tons, to Midland Structural Steel Co.

United States Bureau of Public Roads, State of Washington, Bogachiel Bridge, Port Angeles, 180 tons, to Wallace Equipment Co., Seattle.

Whatcom County, Wash., Nooksack Bridge, 152 tons, to Illinois Steel Bridge Co.

Western Pacific Railway, transfer bridge, Oakland, Cal., 150 tons, to Moore Shipbuilding Co.

Polar Wave Ice & Fuel Co., St. Louis, ice house, 118 tons, to Missouri Bridge & Iron Co.

Lakeside Bridge & Steel Co., Milwaukee, shop extension, 400 tons, fabricated by owner.

Ley Co., Boston, Mass., coal bridge, 300 tons to Worden-Allen Co.

L. E. Meyers Co., Chicago, substation at Aetna, Ind., 150 tons, to Worden Allen Co.

Southern Minnesota Gas & Electric Co., extension at Albert Lea, Minn., 100 tons, to Milwaukee Bridge Co.

Bridge over Willamette River, near Portland, Ore., 6000 tons, to American Bridge Co.

Cleveland-Columbian Co., Cleveland, club house, 150 tons, to Republic Structural Iron Works Co.

New York, Chicago & St. Louis, addition to Conneaut, Ohio, shops, 100 tons, to Erie Steel Construction Co.

Structural Projects Pending

Inquiries for fabricated steel work include the following:

Philadelphia subway extensions, 10,200 tons, bids opened July 15; Keystone State Construction Co. low bidder on general contract and McClintic-Marshall Co. reported to be low bidder on fabricated steel. No award announced as yet.

Telephone exchange, Rutherford, N. J., 300 tons.

Pennsylvania Railroad, bridge in Philadelphia, 500 tons.

State of Delaware, highway bridge, 300 tons.

Consolidated Gas Co., Baltimore, addition to power plant, 700 tons.

Bing & Bing, apartment buildings, one on East Fifty-fourth Street, New York, 500 tons, and one on Seventy-fifth Street, New York, 550 tons.

Erie Railroad, power house at Jersey City, N. J., 300 tons.

Longacre Engineering Co., building at Delancey and Chrystie Streets, New York, 1200 tons.

Friedman apartment building, 25 West Sixty-eighth Street, New York, 800 tons.

Hotel for women, 312 West Thirtieth Street, New York, 500 tons.

Apartment building at West End Avenue and Seventy-seventh Street, New York, 1400 tons.

Knights of Columbus Building, Eighth Avenue and Fifty-first Street, New York, 4000 tons.

Magnolia Petroleum Co., oil storage tank roofs, Dallas, Tex., 1500 tons.

Great Northern Railroad, bridge work, 2300 tons.

National Malleable & Steel Castings Co., plant addition, Indianapolis, 350 tons, bids being taken.

Kanawha & Michigan Railroad, bridge work, 100 tons, bids in.

Pickands, Mather & Co., head frame for mine in Wakefield, Mich., 100 tons.

Apartment house, 1900 Rittenhouse Square, Philadelphia, 1500 tons.

F. W. Woolworth Co. store, Cleveland, 250 tons.

RAILROAD EQUIPMENT BUYING

Orders for 38 Locomotives the Principal Buying by Carriers During the Week

Locomotive orders were the most important activity in the railroad equipment field during the past week, the New York Central buying 25, the New York, New Haven & Hartford 10, and orders for three others bring the total up to 38. Car buying is negligible, but there are inquiries for 576 cars.

The New York Central has ordered 20 switching locomotives from the American Locomotive Co. and 5 from the Lima Locomotive Works.

The Erie Railroad has ordered 1 Pacific type locomotive and 1 Mikado type locomotive from the Baldwin Locomotive Works.

The New York, New Haven & Hartford has placed an order with the American Locomotive Co. for 10 switching locomotives.

The Northern Pacific Terminal has ordered 1 switching locomotive from the American Locomotive Co.

The Bangor & Aroostook Railroad is inquiring for 4 Consolidation type locomotives.

The Reading Co. has ordered 60 passenger and baggage cars as follows: 40 passenger coaches from Bethlehem Steel Co.; 10 baggage cars from the American Car & Foundry Co., and 10 combination passenger and baggage cars from the Standard Steel Car Co.

The Siam State Railways are asking for prices in the United States on 200 4-wheel cars of different types.

The New York, Ontario & Western has issued an inquiry for 6 caboose cars.

The San Antonio & Aransas Pass Railroad is in the market for 50 to 100 tank cars.

The Cuba Cane Sugar Corporation, New York, is inquiring for 210 cane cars for use in Cuba.

The Hershey Chocolate Co., Hershey, Pa., is asking for prices on 50 to 100 tank cars.

The Ford Motor Co. has placed 7 12,500-gal. tank cars with the Standard Tank Car Co.

The Carnegie Steel Co. has ordered 20 12,500-gal. tank cars from the Standard Tank Car Co.

The Detroit, Toledo & Ironton has ordered 10 12,500-gal. tank cars from the Standard Tank Car Co.

NON-FERROUS METALS

The Week's Prices

Cents per Pound for Early Delivery

	Copper, New York		Straits Tin (Spot)	Lead		Zinc	
July	Lake	Electrolytic*	New York	New York	St. Louis	New York	St. Louis
16.....	12.62½	12.12½	46.37½	7.00	6.70	6.20	5.85
17.....	12.62½	12.12½	45.87½	7.00	6.75	6.20	5.85
18.....	12.62½	12.25	46.40	7.00	6.75	6.20	5.85
19.....	12.75	12.25	....	7.00	6.80	6.20	5.85
21.....	12.75	12.50	48.00	7.00	6.85	6.25	5.90
22.....	12.87½	12.50	48.75	7.10	6.85	6.27½	5.92½

*Refinery quotation; delivered price ¼c. higher.

New York

NEW YORK, July 22.

A decidedly better tone pervades all the metal markets and prices are advancing. Better buying of copper and lead have advanced quotations and a more active tin market has resulted in higher values. Zinc has expanded the least in activity and quotations.

Copper.—Better buying and expanding inquiry for electrolytic copper has featured the past week and there has been a sharp upturn in prices. Quotations advanced at least ¼c. over the week end and the tendency is still upward. There has been substantial buying by domestic consumers as well as considerable demand for export. An electric and a large steel company have each purchased 2000 net tons. Yesterday and today the general market assumed something of an excited condition because some consumers, who have remained out of the market for some time, have been urgent in their inquiries. The publication of estimates of the statistics for June, which showed a decline in stocks of something like 3,000,000 lb. and other favorable tendencies, has been a bullish factor. There is also no discounting the sentimental effect at least of the prospects of the putting into effect of the Dawes plan in Europe. Electrolytic copper today is quoted at a range of 12.75c. to 12.87½c., delivered, with prospects that the latter quotation will very soon be the minimum. Some producers claim that they are not selling even at these levels. The entire situation is more optimistic than in many weeks. Lake copper is quoted at 12.87½c., delivered.

Tin.—The week has been an active one with sales totaling at least 1500 tons. Dealers have been the principal buyers, but consumers on July 17 took a good share of the business. About 250 tons was sold on July 15 with 100 and 300 tons on the two following days respectively. On July 18 late in the day the market turned active with all London offerings absorbed, and even on Saturday, July 19, at least 100 tons changed hands. Yesterday and today the market has been moderately active with spot Straits tin quoted at 48.75c., New York. London quotations today are considerably higher than a week ago with spot standard quoted at £245 10s., future standard at £245 10s. and spot Straits at £247 15s. The Singapore price yesterday was £242. Arrivals thus far this month have been 3387 tons, with 3795 tons reported afloat.

Lead.—The market has turned very active and strong and several sellers are now reluctant to quote. The outside market is higher at 7.10c., New York, with St. Louis stronger at 6.85c. The price of the leading interest continues at 7c., New York.

Zinc.—There has been considerable demand from foreign consumers and sales have been fairly heavy. Due largely to this cause the market has advanced slightly so that prime Western for early delivery is quoted at 5.90c. to 5.95c., St. Louis, or 6.25c. to 6.30c., New York, for early delivery. There has been some improvement in domestic buying, particularly by galvanizers, but it has not yet been much of a factor.

Nickel.—Quotations for shot and ingot nickel are unchanged at 27c. to 32c. per lb., with electrolytic nickel held at 32c. by the leading producers.

Antimony.—Chinese metal in wholesale lots is quoted at 8.37½c. per lb., New York, duty paid, with the market inactive.

Aluminum.—Virgin metal, 98 to 99 per cent pure, is offered by importers at 26.50c. to 27c. per lb., duty paid, delivered.

Old Metals.—There is a much better feeling in the market. Prices are higher and inquiry is good. Dealers' selling prices are as follows:

	Cents Per Lb.
Copper, heavy and crucible	12.25
Copper, heavy and wire	11.50
Copper, light and bottoms	10.50
Heavy machine composition	10.00
Brass, heavy	8.00
Brass, light	6.50
No. 1 red brass or composition turnings	8.75
No. 1 yellow rod brass turnings	7.25
Lead, heavy	6.50
Lead, tea	5.25
Zinc	4.25
Cast aluminum	16.00
Sheet aluminum	16.50

Chicago

JULY 22.—Copper, tin, lead and zinc have advanced on heavier demand. It is believed that the low point has been passed in all of these metals except tin, which is highly speculative. Most of the old metals have also gone up. We quote in carload lots: Lake copper, 13c.; tin, 47.50c.; lead, 6.95c.; spelter, 6c.; antimony, 10c., in less than carload lots. On old metals we quote copper wire, crucible shapes and copper clips, 9.75c.; copper bottoms, 8.75c.; red brass, 8c.; yellow brass, 6.50c.; lead pipe, 6c.; zinc, 3.75c.; pewter, No. 1, 25c.; tin foil, 29c.; block tin, 35c.; all buying prices for less than carload lots.

Belfont Steel & Wire Co. Will Build Open-Hearth Plant and Rolling Mills

CINCINNATI, July 22.—Stockholders of the Belfont Steel & Wire Co., Ironton, Ohio, at a meeting last week authorized the directors to proceed with the erection of an open-hearth plant and rolling mills. The company has optioned equipment for the mills and this will be purchased outright.

At the meeting, S. Coles Peebles, president of the company, submitted his resignation, which was accepted, I. P. Blanton being elected to succeed him. Mr. Peebles will devote all his time to brick making plants, in which he is heavily interested.

Copper Plant to Be Built in Baltimore

Construction of the new rod and wire plant will be started soon by the Baltimore Copper Smelting & Rolling Co., subsidiary of the American Smelting & Refining Co., and, if present plans carry, the plant will be ready for operation early in 1925.

The building, which is estimated to cost about $500,000, will be one-story, covering two acres, and will be equipped with modern machinery for rolling copper rods and pulling them into wire of various sizes. About 150 men will be employed at the outset. The structure will be erected on property owned by the company at Canton, Baltimore, where it holds 50 acres of land, 30 acres of which are covered with buildings. The new plant will have an estimated capacity of 40,000 tons of rods and wire annually. The copper plant now operated by the company at Baltimore is the largest owned by the American Smelting & Refining Co. Present output is about 20,000 tons monthly of refined electrolytic copper. In normal times production is increased to 30,000 tons. When the plant is in full operation as many as 3500 men are carried on the payrolls.

The Motor Wheel Corporation, Lansing, Mich., recently resumed operations after a two weeks shutdown and is now employing 1700 people five days a week.

Prices Finished Iron and Steel f.o.b. Pittsburgh

Carload Lots

Plates

Sheared, tank quality, base, per lb.....2c. to 2.15c.

Structural Materials

Beams, channels, etc., base, per lb.....2c. to 2.15c.
Sheet piling .....2.10c. to 2.25c.

Iron and Steel Bars

Soft steel bars, base, per lb.....2.15c.
Soft steel bars for cold finishing.....$3 per ton over base
Reinforcing steel bars, base.....2.15c.
Refined iron bars, base, per lb.....3c.
Double refined iron bars, base, per lb.....4.50c. to 4.75c.
Stay bolt iron bars, base, per lb.....6.50c. to 7.00c.

Hot-Rolled Flats

Hoops, base, per lb.....2.60c.
Bands, base, per lb.....2.60c.
Strips, base, per lb.....2.50c. to 2.60c.

Cold-Finished Steel

Bars and shafting, drawn or rolled, base, per lb.....2.80c.
Bars and shafting, drawn or rolled, l.c.l., per lb.....3.05c.
Shafting, turned and polished, base, per lb.....2.80c.
Bars, S. A. E. Series, No. 2100.....4.50c. to 4.75c.
Bars, S. A. E. Series, No. 2300.....6.00c. to 6.25c.
Bars, S. A. E. Series, No. 3100.....5.00c. to 5.25c.
Strips, base, per lb.....4.25c. to 4.50c.

Wire Products

(To jobbers in car lots)

Nails, base, per keg.....$2.85
Galvanized nails, 1 in. and over.....$2.25 over base
Galvanized nails, less than 1 in..... 2.50 over base
Bright plain wire, base, No. 9 gage, per 100 lb.....$2.60
Annealed fence wire, base, per 100 lb..... 2.75
Spring wire, base, per 100 lb..... 3.70
Galvanized wire No. 9, base, per 100 lb..... 3.20
Galvanized barbed, base, per 100 lb..... 3.55
Galvanized staples, base, per keg..... 3.55
Painted barbed wire, base, per 100 lb..... 3.30
Polished staples, base, per keg..... 3.30
Cement coated nails, base, per count keg..... 2.25
Bale ties, carloads to jobbers...75, 5, 5 and 2½ per cent off list
Woven fence, carloads (to jobbers)....$60 per net ton (base)
Woven fence, carloads (to retailers)...$65 per net ton (base)

Bolts and Nuts

Machine bolts, small, rolled threads,
65, 10 and 10 per cent off list
Machine bolts, all sizes, cut threads..65 and 10 per cent off list
Carriage bolts ⅝ x 6 in.,
Smaller and shorter, rolled threads .65 and 10 per cent off list
Carriage bolts, cut threads, all sizes.....65 per cent off list
Lag bolts .....70 and 10 per cent off list
Plow bolts, Nos. 1, 2 and 3 heads....50 and 10 per cent off list
Other style heads.....20 per cent extra
Machine bolts, c.p.c. and t. nuts, ⅝ x 4 in.,
50, 10 and 10 per cent off list
Larger and longer sizes.....50, 10 and 10 per cent off list
Hot pressed squares or hex. nuts, blank.....5c. off list
Hot pressed nuts, tapped.....5c. off list
C.p.c. and t. square or hex. nuts, blank.....4.50c.
C.p.c. and t. square or hex nuts, tapped.....4.50c
Semi-finished hex. nuts:
⅞ in. and smaller, U. S. S.....80, 10 and 5 per cent off list
⅝ in. and larger, U. S. S.....75, 10 and 5 per cent off list
Small sizes, S. A. E.....80, 10, 10 and 5 per cent off list
S. A. E., ⅝ in. and larger.....75, 10 and 5 per cent off list
Stove bolts in packages.....80, 10 and 5 per cent off list
Stove bolts in bulk.....80, 10, 5 and 2½ per cent off list
Tire bolts .....60 and 10 per cent off list
Bolt ends with hot pressed nuts.....60 and 5 per cent off list
Bolt ends with cold pressed nuts.....50 and 5 per cent off list
Turnbuckles, with ends, ½ in. and smaller,
55 and 5 per cent off list
Turnbuckles, without ends, ½ in. and smaller,
70 and 10 per cent off list
Washers .....5.75c. to 6.00c.
Lock washers .....80 per cent off list

Semi-Finished Castellated and Slotted Nuts

(To jobbers and consumers in large quantities f.o.b. Pittsburgh.)

	Per 1000 S. A. E.	Per 1000 U. S. S.		Per 1000 S. A. E.	Per 1000 U. S. S.
¼-in.	$4.25	$4.25	⅞-in.	$13.25	$13.50
5/16-in.	4.90	4.90	1-in.	16.25	16.50
⅜-in.	5.90	6.25	1⅛-in.	22.50	23.00
7/16-in.	7.50	8.50	1¼-in.	34.00	34.00
½-in.	9.75	10.00	1⅜-in.	53.00	55.00

Larger sizes—Prices on application.

Cap and Set Screws

Milled hex. head cap screws.....75, 10 and 5 per cent off list
Milled standard set screws, case hardened,
75, 10 and 5 per cent off list
Milled headless set screws, cut thread,
75, 10 and 5 per cent off list
Upset hex. head cap screws, U. S. S. thread,
80, 10 and 10 per cent off list
Upset hex. head cap screws, S. A. E. thread,
80, 10 and 10 per cent off list
Milled studs .....65 and 10 per cent off list

Rivets

Large structural and ship rivets, base, per 100 lb.....$2.60
Small rivets .....70, 10 and 5 per cent off list

Track Equipment

Spikes, ⅜ in. and larger, base, per 100 lb.....$2.90
Spikes, ½ in. and smaller, base, per 100 lb..... 3.25
Spikes, boat and barge, base, per 100 lb..... 3.25
Track bolts, all sizes, base, per 100 lb..... 3.75
Track bolts, heat-treated, base, per 100 lb..... 4.25
Tie plates, per 100 lb..... 2.50 to 2.55
Angle bars, base, per 100 lb..... 2.75

Welded Pipe

Butt Weld

Steel Inches	Black	Galv.	Iron Inches	Black	Galv
⅛	45	19½	¼ to ⅜.....	+11	+39
¼ to ⅜.....	51	25½	½	22	2
½	56	42½	¾	28	11
¾	60	48½	1 to 1½.....	30	13
1 to 3.....	62	50½			

Lap Weld

2	55	43½	2	23	7
2½ to 6.....	59	47½	2½	26	11
7 and 8.....	56	43½	3 to 6.....	28	13
9 and 10.....	54	41½	7 to 12.....	26	11
11 and 12....	53	40½			

Butt Weld, extra strong, plain ends

⅛	41	24½	2 to 3.....	61	50½
¼ to ⅜.....	47	30½	¼ to ⅜.....	+19	+54
½	53	42½	½	21	7
¾	58	47½	¾	28	12
1 to 1½.....	60	49½	1 to 1¼.....	30	14

Lap Weld, extra strong, plain ends

2	53	42	2	23	9
2½ to 4.....	57	46½	2½ to 4.....	29	15
4½ to 6.....	56	45½	4½ to 6.....	28	14
7 to 8.....	52	39½	7 to 8.....	21	7
9 and 10.....	45	32½	9 to 12.....	16	2
11 and 12....	44	31½			

To the large jobbing trade the above discounts are increased by one point, with supplementary discount of 5 per cent on black and 1½ points, with a supplementary discount of 5 per cent on galvanized.

Boiler Tubes

Lap Welded Steel		*Charcoal Iron*	
2 to 2¼ in.....	27	1½ in. .....+18	
2½ to 2¾ in.....	37	1¾ to 1⅞ in.....+ 8	
3 in.	40	2 to 2¼ in.....— 2	
3¼ to 3¾ in.....	42½	2½ to 3 in.....— 7	
4 to 13 in.....	46	3¼ to 4½ in.....— 9	

Standard Commercial Seamless Boiler Tubes

Cold Drawn			
1 in.	55	3 and 3¼ in.....	36
1¼ and 1½ in.....	47	3½ and 3¾ in.....	37
1¾ in.	31	4 in.	41
2 and 2¼ in.....	22	4½ in. and 5 in.....	33
2½ and 2¾ in.....	32		

Hot Rolled

3 and 3¼ in.....	38	4 in.	43
3½ in. and 3¾ in....	39		

Less carloads, 4 points less. Add $8 per net ton for more than four gages heavier than standard. No extra for lengths up to and including 24 ft. Sizes smaller than 1 in. and lighter than standard gage to be held at mechanical tube list and discount. Intermediate sizes and gages not listed take price of next larger outside diameter and heavier gage.

Seamless Mechanical Tubing

Carbon under 0.30, base.....87 per cent off list
Carbon 0.30 to 0.40, base.....85 per cent off list
Plus usual differentials and extras for cutting. Warehouse discounts range higher.

Seamless Locomotive and Superheater Tubes

	Cents per Ft.		Cents per Ft.
2-in. O.D. 12 gage....	15	2¼-in. O.D. 10 gage..	20
2-in. O.D. 11 gage....	16	3-in. O.D. 7 gage.....	35
2-in. O.D. 10 gage....	17	1½-in. O.D. 9 gage...	15
2¼-in. O.D. 12 gage..	17	5⅝-in. O.D. 9 gage...	55
2¼-in. O.D. 11 gage..	18	5½-in. O.D. 9 gage...	57

Tin Plate

Standard cokes, per base box.....$5.50

Terne Plate

(Per Package, 20 x 28 in.)

8-lb. coating, 100 lb. base $11.00	20-lb. coating I. C....$14.90
8-lb. coating I. C.... 11.30	25-lb. coating I. C.... 16.20
12-lb. coating I. C.... 12.70	30-lb. coating I. C.... 17.35
15-lb. coating I. C.... 13.95	35-lb. coating I. C.... 18.35
	40-lb. coating I. C.... 19.35

Sheets

Blue Annealed

Nos. 9 and 10 (base), per lb.....2.60c. to 2.80c.

Box Annealed, One Pass Cold Rolled

No. 28 (base), per lb.....3.40c. to 3.65c.

Automobile Sheets

Regular auto body sheets, base (22 gage), per lb. 5.00c. to 5.10c.

Galvanized

No. 28 (base), per lb.....4.50c. to 4.80c.

Long Ternes

No. 28 gage (base), 8-lb. coating, per lb.....5.30c.

Tin-Mill Black Plate

No. 28 (base), per lb.....3.50c. to 3.65c.

Prices of Raw Materials, Semi-Finished and Finished Products

Ores

Lake Superior Ores, Delivered Lower Lake Ports

Old range Bessemer, 55 per cent iron	$5.65
Old range non-Bessemer, 51½ per cent iron	4.90
Mesabi Bessemer, 55 per cent iron	5.40
Mesabi non-Bessemer, 51½ per cent iron	4.75

Foreign Ore, per Unit, c.i.f. Philadelphia or Baltimore

Iron ore, low phos., copper free, 55 to 58 per cent iron in dry Spanish or Algerian	9.00c. to 9.50c.
Iron ore, Swedish, average 66 per cent iron	9.50c.
Manganese ore, washed, 51 per cent manganese, from the Caucasus, nominal	45c.
Manganese ore, ordinary, 48 per cent manganese, from the Caucasus	42c.
Manganese ore, Brazilian or Indian, nominal	42c.
Tungsten ore, per unit, in 60 per cent concentrates	$8.75 to $10.00
Chrome ore, basic, 48 per cent Cr_2O_3, crude, per ton, c.i.f. Atlantic seaboard	19.00 to 22.00
Molybdenum ore, 85 per cent concentrates, per lb. of MoS_2, New York	75c. to 85c.

Ferroalloys

Ferromanganese, domestic, 80 per cent, furnace, or seaboard, per ton	$105.00
Ferromanganese, British, 80 per cent f.o.b. Atlantic port, duty paid	105.00
Ferrosilicon, 50 per cent, delivered	$70.00 to 75.00
Ferrosilicon, 75 per cent	140.00
Ferrotungsten, per lb. contained metal	90c. to 93c.
Ferrochromium, 4 to 6 per cent carbon, 60 to 70 per cent Cr. per lb. contained Cr. delivered	10.75c.
Ferrochromium, 6 to 7 per cent carbon, 60 to 70 per cent Cr., per lb.	10.50c.
Ferrovanadium, per lb. contained vanadium	$3.50 to $4.00
Ferrocarbontitanium, 15 to 18 per cent, per net ton	$100.00

Spiegeleisen, Bessemer Ferrosilicon and Silvery Iron

(Per gross ton furnace unless otherwise stated)

Spiegeleisen, domestic, 19 to 21 per cent.....$33.00 to $35.00
Spiegeleisen, domestic, 16 to 19 per cent..... 32.00 to 34.00
Ferrosilicon, Bessemer, 10 per cent, $39.50; 11 per cent, $42, 12 per cent, $43.50; 14 to 16 per cent (electric furnace), $40.00.
Silvery iron, 5 per cent, $27.00; 6 per cent, $28.00; 7 per cent, $29.00; 8 per cent, $30.50; 9 per cent, $32.50; 10 per cent, $34.50; 11 per cent, $37.00; 12 per cent, $39.50.

Fluxes and Refractories

Fluorspar, 80 per cent and over calcium fluoride, not over 5 per cent silica, per net ton f.o.b. Illinois and Kentucky mines	$19.00 to $22.00
Fluorspar, 85 per cent and over calcium fluoride, not over 5 per cent silica, per net ton f.o.b. Illinois and Kentucky mines	21.00 to 23.50

Per 1000 f.o.b. works:

	High Duty	Moderate Duty
Fire Clay:		
Pennsylvania	$40.00 to $43.00	$37.00 to $40.00
Maryland	45.00 to 47.00	40.00 to 42.00
Ohio	40.00 to 43.00	37.00 to 39.00
Kentucky	42.00 to 43.00	37.00 to 39.00
Illinois	——	37.00 to 42.00
Missouri	42.00 to 45.00	35.00 to 40.00
Ground fire clay, per net ton		6.00 to 7.00
Silica Brick:		
Pennsylvania		35.00 to 38.00
Chicago		47.00
Birmingnam		50.00
Ground silica clay, per net ton		7.50 to 8.00
Magnesite Brick:		
Standard size, per net ton (f.o.b. Baltimore and Chester, Pa.)		65.00
Grain magnesite, per net ton (f.o.b. Baltimore and Chester, Pa.)		40.00
Chrome Brick:		
Standard size, per net ton		45.00

Semi-Finished Steel, F.O.B. Pittsburgh or Youngstown, per gross ton

Rolling billets, 4-in. and over	$38.00
Rolling billets, 2-in. and under	38.00
Forging billets, ordinary carbons	43.00
Sheet bars, Bessemer	$38.00 to 40.00
Sheet bars, open-hearth	38.00 to 40.00
Slabs	38.00
Wire rods, common soft, base, No. 5 to ⅜-in.	$48.00
Wire rods, common soft, coarser than ⅜-in.	$2.50 over base
Wire rods, screw stock	$5.00 per ton over base
Wire rods, carbon, 0.20 to 0.40	3.00 per ton over base
Wire rods, carbon 0.41 to 0.55	5.00 per ton over base
Wire rods, carbon 0.56 to 0.75	7.50 per ton over base
Wire rods, carbon over 0.75	10.00 per ton over base
Wire rods, acid	15.00 per ton over base
Skelp, grooved, per lb.	2.15c.
Skelp, sheared, per lb.	2.15c.
Skelp, universal, per lb.	2.15c.

Finished Iron and Steel, F.O.B. Mill

Rails, heavy, per gross ton	$43.00
Rails, light, new steel, base, lb.	1.90c.
Rails, light, rail steel, base, per lb.	1.65c. to 1.75c.
Bars, common iron, base, per lb., Chicago mill	2.20c.
Bars, common iron, Pittsburgh mill	2.40c.
Bars, rail steel reinforcing, base, per lb.	2.10c. to 2.15c.
Rail steel bars, base, per lb., Chicago mill	2.10c.
Cold-finished steel bars, base, Chicago, per lb.	2.80c.
Ground shafting, base, per lb.	3.30c.
Cut nails, base, per keg	$2.90

Alloy Steel

S. A. E. Series Numbers	Bars 100 lb.
2100* (1¼% Nickel, 10 to 20 per cent Carbon)	$3.25 to $3.50
2300 (3½% Nickel)	4.75 to 5.00
2500 (5% Nickel)	6.00 to 6.50
3100 (Nickel Chromium)	3.75 to 4.00
3200 (Nickel Chromium)	5.50 to 5.75
3300 (Nickel Chromium)	8.00
3400 (Nickel Chromium)	6.50 to 7.00
5100 (Chromium Steel)	3.35 to 3.75
5200* (Chromium Steel)	7.50 to 8.00
6100 (Chromium Vanadium bars)	4.50 to 4.75
6100 (Chromium Vanadium spring steel)	4.25 to 4.50
9250 (Silicon Manganese spring steel)	3.50 to 3.75
Nickel Chrome Vanadium (0.60 Nickel, 0.50 Chromium, 0.15 Vanadium)	4.25 to 4.50
Chromium Molybdenum bars (0.80—1.10 Chromium, 0.25—0.40 Molybdenum)	4.35 to 4.50
Chromium Molybdenum bars (0.50—0.70 Chromium, 0.15—0.25 Molybdenum)	3.85 to 4.25
Chromium Molybdenum spring steel (1—1.25 Chromium, 0.30—0.50 Molybdenum)	4.75 to 5.00

Above prices are for hot-rolled alloy steel bars, forging quality, per 100 lb., f.o.b. Pittsburgh. Billets 4 x 4 in. and larger are $10 per gross ton less than net ton prices for bars of same analysis. On smaller than 4 x 4-in. billets the net ton bar price applies.

*Not S.A.E. specifications, but numbered by manufacturers to conform to S.A.E. system.

Freight Rates

All rail freight rates from Pittsburgh on finished iron and steel products, carload lots, 36,000 lb. minimum carload, per 100 lb.:

Philadelphia, domestic	$0.32	Buffalo	$0.265	St. Louis	$0.43	*Pacific Coast	$1.15
Philadelphia, export	0.235	**Cleveland	0.215	Kansas City	0.735	*Pac. Coast, ship plates	1.20
Baltimore, domestic	0.31	**Cleveland, Youngstown Comb.	0.19	Kansas City (pipe)	0.705	Birmingham	0.58
Baltimore, export	0.225	Detroit	0.29	St. Paul	0.60	Memphis	0.56
New York, domestic	0.34	Cincinnati	0.29	Omaha	0.735	Jacksonville, all rail	0.70
New York, export	0.255	Indianapolis	0.31	Omaha	0.705	Jacksonville, rail and water	0.415
Boston, domestic	0.365	Chicago	0.34	*Denver	1.15	New Orleans	0.67
Boston, export	0.255			†Denver (pipe)	1.17		

*Applies minimum carload 80,000 lb. **There will be no official change until Sept. 20, but, as for some time, the 19c. rate prevails. †Minimum loading 46,000 lb.

Rates from Atlantic Coast ports (i.e., New York, Philadelphia and Baltimore) to Pacific Coast ports of call on most steamship lines, via the Panama Canal, are as follows: Pig iron, 35c.; ship plates, 40c.; ingots and muck bars, structural steel, common wire products, including cut or wire nails, spikes, and wire hoops, 40c.; sheets and tin plates, 40c.; sheets No. 12 gage and lighter, 50c.; rods, 40c.; wire rope cables and strands, 45c.; wire fencing, netting and stretcher, 40c.; pipes not over 12 in. in diameter, 55c.; over 12 in. in diameter, 2½c. per in. or fraction thereof additional. All rates per 100 lb. in carload lots, minimum 36,000 lb.

PERSONAL

Franklin Agge has resigned as manager of works of the Republic Metalware Co., Buffalo, and will retire from active business life, though he remains a director of the company. Mr. Agge has been associated with the engineering profession 57 years, serving successively as foreman at the Portland Locomotive Works, superintendent of the Star Match Co. and chief engineer of the Forest City Sugar Refinery, all of Portland, Me. As superintendent of the Cumberland Mfg. Co. he traveled much both in the United States and Europe, installing industrial and municipal filter plants. Later he became associated with the American Ordnance Co., Bridgeport, Conn., as superintendent, and with the Oil Well Supply Co. at Oil City, Pa., as general superintendent. When the old firm of Sidney Shepard & Co. was incorporated at the Republic Metalware Co., in 1905, Mr. Agge came to Buffalo as manager of works and a director of the new corporation.

FRANKLIN AGGE

B. L. Worden was elected president of the Cutler-Hammer Mfg. Co. at a meeting of directors held on May 29. He succeeds F. R. Bacon, who has been elected to the newly created chairmanship of the board of directors, after serving as president for 27 years. Mr. Worden was president for 20 years of the Worden Allen Co. and Lackawanna Bridge Co., both of which he founded, and for five years was president of the Ferguson Steel & Iron Corporation. About two years ago he sold his interests in these companies and retired from them. During the war he was general manager of the yard at Newark, N. J., belonging to the Submarine Boat Corporation, and had charge of the design and construction of the yard and the building of the 150 duplicate fabricated steel ships built there for the Emergency Fleet Corporation. During the past two years Mr. Worden has given his time to the reorganization of the Beaver Board Companies, of which he was president. Lately he retired and was elected chairman of the board. As president of the Cutler-Hammer company he is actively in charge of affairs. Mr. Bacon's connection with the Cutler-Hammer Mfg. Co. dates back to the early days of the electrical industry, when recognizing the possibilities in the application of electric motor drive, he set his efforts to the development of rheostats, resistors, and field regulators, then to the wide range of products developed by Cutler-Hammer engineers. He was originally president of the American Rheostat Co., Milwaukee, founded in 1896, and which in 1898 bought out the Cutler-Hammer Mfg. Co. of Chicago. Mr. Bacon was then elected president of the Cutler-Hammer company, and its operations were carried on in Chicago until the next year, when it was moved to Milwaukee. He has been president of the company continuously since that date.

A. H. Holliday, export manager of the Jones & Laughlin Steel Corporation, arrived in New York on the steamship Leviathan on Tuesday accompanied by his wife and daughter. They have spent two months abroad, principally in Great Britain and France.

Robert J. Anderson, now on leave of absence from the Bureau of Mines, Pittsburgh, is actively at work as a graduate student in metallurgy at the Massachusetts Institute of Technology, Cambridge, Mass., in conjunction with his work as a consulting metallurgical engineer.

Harry J. Swanson, since 1922 general sales manager of the Peerless Machine Co., Racine, Wis., has resigned to become vice-president and treasurer of the Detroit Piston Pin & Mfg. Co. He formerly was vice-president and general sales manager of the Detroit Machine Tool Co.

Arthur Kipgen, chief technical director of Acieries Reunies de Burbach-Eich-Dudelange, the most important iron and steel corporation in Luxemburg, commonly known as "Arbed," is now in the United States visiting the centers of iron and steel manufacture. Accompanying him are Leopold Bouvier, manager of rolling mills of Arbed, and Henry Vehling, consulting engineer of the Société Metallurgique des Terres Rouges (formerly Rothe Erde), which is closely allied with Arbed.

A. C. Blanchard of the engineering staff of the Hydro-Electric Canal at Niagara Falls, Ont., for the past six years, has been named chief hydraulic engineer of the New Brunswick Power Commission and will leave for the East this month.

J. H. Slawson, formerly vice-president and general manager of the Joliet Railway Supply Co., Chicago, has been appointed manager of the newly created brake beam department of the Chicago Malleable Castings Co., with headquarters at 435 Railway Exchange Building, Chicago. C. A. Benz, formerly assistant manager of the Joliet company, has been appointed assistant manager of the brake beam department.

M. F. Beetham has succeeded C. H. Erickson as service inspector in the eastern district for the Whiting Corporation, Harvey, Ill., manufacturer of foundry equipment. Mr. Erickson has left the company.

F. F. Elliott has been made works manager of the Cleveland foundry, Westinghouse Electric & Mfg. Co., succeeding Charles F. Knowlton, who died recently. Mr. Elliott goes to Cleveland from the company's foundry at Springfield, Mass., where he has held the position of foundry superintendent since 1920. He was with the Bucyrus Steam Shovel & Bridge Co., Bucyrus, Ohio, prior to entering the employ of the Westinghouse company 22 years ago as a patternmaker at the Allegheny foundry, North Side, Pittsburgh. He subsequently served as foreman of the Allegheny pattern shop and the one in Cleveland. From May, 1916, until his transfer to Springfield in 1920 he had charge of the brass foundry at the East Pittsburgh plant of the company.

P. P. Allen, formerly manager of the American Steel Foundries, Franklin, Pa., has left for California, where he will be located hereafter. The company's plant has been closed for a year and there are no immediate indications of reopening.

H. C. Breidert, who has been contracting engineer at the Chicago office of the Fort Pitt Bridge Works, has been transferred to the main office, Oliver Building, Pittsburgh, as chief contracting engineer. E. K. Adams succeeds him as contracting engineer in Chicago.

D. H. Boothby has been appointed New York sales representative of the Leland-Gifford Co., Worcester, Mass., manufacturer of drilling machines, whose New York office is at 149 Broadway. Mr. Boothby was formerly with the Philadelphia office of the Brown & Sharpe Mfg. Co. He succeeds Walter F. Henly, who recently became New York sales representative for the Hendey Machine Co., Torrington, Conn.

J. R. Bennington has been appointed to succeed Edward Hughes as purchasing agent of the Lehigh Coal & Navigation Co., 437 Chestnut Street, Philadelphia. Mr. Bennington's address is 612 Lafayette Building, that city.

P. J. Shouvlin, Springfield, Ohio, president Superior

Gas Engine Co., sailed July 12 on a business trip abroad. He will visit England, Ireland, Germany, Belgium and Rumania, returning about Oct. 1. Mr. Shouvelin has oil interests in Rumania, it is reported.

OBITUARY

HAROLD COLBERT JONES, for several years vice-president and a director of the Inland Steel Co., Chicago, and latterly president of the Mid-West Forging Co., Chicago, died in that city on July 18, after four days' illness with pneumonia. Mr. Jones was 46 years of age and received his education at the Chicago Manual Training School, now a part of the University of Chicago, and at Cornell University, where he was graduated in mechanical engineering. His first business connection was with the Link-Belt Co., Chicago, which he served for a short period in the drafting department. He then became associated with the Inland Steel Co., becoming night superintendent of the Indiana Harbor plant and subsequently taking charge of the Chicago Heights plants. For several years he was identified with the company's coal properties, following which he again devoted his attention to the steel plants, particularly the Chicago Heights works. On July 1, 1923, he resigned as vice-president and director to become president of the Mid-West Co., in which he previously had held an interest. Mr. Jones was a member of the American Society of Mechanical Engineers, the Chicago Athletic Association and the American Iron and Steel Institute. He was largely responsible for the development of the steel fence post business and was also a pioneer in developing steel sectional buildings, having been instrumental in organizing the Steel Fabrication Co., later sold to the Steel Fabricating Corporation, Michigan City, Ind. Mr. Jones was the son of G. H. Jones, for many years first vice-president and general sales manager of the Inland company.

HAROLD C. JONES

CONRAD C. ARENSBURG, president and one of the organizers of the McCullough-Dalzell Crucible Co., Pittsburgh, died at his home in that city on July 18, following an illness of several weeks. He was a Civil War veteran, having enlisted at the outbreak of the conflict and serving until severely wounded at Boonsboro, Md., shortly after the battle of Gettysburg. He was born in Pittsburgh 84 years ago.

WILLIAM G. HENDERSON, one of the pioneer iron manufacturers of the Shenango Valley and for about 25 years engaged in the pig iron business in Cleveland, died in a Cleveland hospital, July 20, after an extended illness. Mr. Henderson was identified with the P. L. Kimberly Iron Co. in Sharon, Pa., and later became traveling salesman for the Spearman Iron Co., which position he filled until he went into the pig iron brokerage business in Cleveland about 25 years ago. He was born in West Middlesex, Pa., 70 years ago, and received his education at Oberlin College, Oberlin, Ohio.

ISAAC H. DENTON, president Denton & Anderson Co., Cleveland, died July 14, aged 49 years. He was formerly secretary of the Cleveland Tool & Supply Co. and 14 years ago formed the Denton & Anderson Co. as a sales company to represent the Ohio Seamless Tube Co., Shelby, Ohio. He was a director of the Ohio Seamless Tube Co., a member of the American Iron and Steel Institute and also of the Society of Automotive Engineers.

RILEY L. REDPATH, general manager of manufacturing, American Radiator Co., died last week. He had been with the company 30 years in various capacities. Beginning in St. Louis, he went to Detroit, Buffalo, Kansas City, then back to Buffalo where he lived for the last four years. During the war he served as a member of the Railroad Labor Board in Washington.

LAWRENCE FITCH, president Western Malleables Co., Beaver Dam, Wis., died July 16. He was a native of Milwaukee, born in 1874, and had wide acquaintance in the iron and steel industry, especially in railroad supply circles. Following his graduation from Sheffield School, Yale University, in 1898, he joined the Railroad Supply Co., Chicago. He was elected vice-president of the Beaver Dam Malleable Iron Co. in 1905 and became president upon its reorganization as the Western Malleables Co. In 1910 Mr. Fitch organized the Globe Seamless Steel Tubes Co., Milwaukee, disposing of this interest about two years ago. He also was a vice-president of the National Exchange Bank, Milwaukee, and president of the Independent Harvester Co., Plano, Ill.

JOHN FRICKER, long identified with the metal working trade, died at his home in Rochester, N. Y., July 16, aged 79 years. He was born at Preston, Ont., and came to Rochester in 1863, where for several years he was connected with the John Siddons Co. In 1880 he started in the sheet metal working business for himself and since that time operated the plant bearing his name.

EDMUND J. KASEL, general superintendent and one of the owners of the Janson Steel & Iron Co., Columbia, Pa., died July 15, following an operation for appendicitis. Since leaving school he had been connected with the different iron industries of Columbia in various capacities, but after the deaths of Frank and Valentine Janson he became actively engaged in the continuation of the company which bears their name. Mr. Kasel was 42 years of age and is survived by his wife, a son and daughter.

RICHARD HARRISON, for nearly 20 years an employee of the B. F. Sturtevant Co., Hyde Park, Boston, died July 16, at the Massachusetts Homeopathic Hospital, Boston, following an illness of five weeks. He was manager of the company's foundry. Mr. Harrison was born in England 61 years ago and came to this country as a boy.

JOSEPH A. CRANE, organizer of the Joseph A. Crane Machinery Co., Rochester, N. Y., died at his home in that city on July 20, aged 69 years. At the time of his death he was city clerk at Rochester and was formerly postmaster and commissioner of charities there.

JOHN HENRY CREMER, for many years one of the best known chemists and metallurgists of Cleveland, died at Spartanburg, S. C., July 20, aged 78 years. For fifteen years he had been a winter resident of Spartanburg. He was born in Batavia, Dutch East Indies, of French Huguenot descent, and came to the United States in the early eighteen-seventies. For a time he was connected with the early blast furnace operations of Andrew Carnegie and later was superintendent of a blast furnace of the Illinois Steel Co. Removing to Cleveland, he established himself as an analytical chemist, specializing in iron ore analysis. In this work he was associated for a number of years with G. A. Bicknell, and was co-author with the latter of the "Chemical and Metallurgical Handbook," a volume of about 350 pages which was brought out in 1898. Mr. Cremer had to do with the early manufacture of ferromanganese in the United States.

Ordered to Abandon Pittsburgh Plus

(*Continued from page* 209)

"The evidentiary support of these propositions is not to be lightly disregarded and I am not to be understood as having decided adversely to them. But if we conclude that these propositions are well founded, the question yet remains whether these manifestations qualify the forces of causation as unlawful and bring those causes within the scope of the commission's corrective powers.

"The law does not require absolute freedom of competition. Nor does the law enjoin the observance of sound economic principles. The Federal Trade Commission has not been given a mandate to establish any more the one than the other. It has to do solely with the legal concept of competitive requirements, however short that may be of the true standard. And if the laws permit the use of unsound economic principles, it seems that this tolerance is the act of the body of citizens themselves and must continue until a clearer understanding is demonstrated in terms of a legislative declaration.

"The existence of the Steel Corporation, the scope of its operations, the power which it exerts, its actual or potential influence, has received legal sanction. The necessary consequences of its being and the natural results of its operation, must be accepted also. It may without violation of any law of which I am aware put the same price on all its products and base this price at one specific place if it so desires. In the sight of the law it is as though there was but one plant and its products. The Pittsburgh base, then, is the exercise of a privilege which naturally and necessarily follows from the grant of power to combine the ownership of several plants.

"As has been pointed out, while the Steel Corporation quotes at Pittsburgh plus freight to point of consumption, it does not sell at that price but deducts the actual freight charge involved in the movement. It is argued that this practice is unlawful because (a) a resulting price discrimination which substantially lessens competition in steel fabrication is necessarily involved, which is not justificable as a difference in transportation cost, and (b) the refusal to sell f.o.b. the mill nearest the point of consumption with or without the actual freight charge results in a suppression of competition both in the production and fabrication of steel and tends to monopoly.

Effect of Freight Rates

"Freight rates unquestionably create an area of preference with relation to a point of production. While this area of preference is extended as several points of production are combined under one ownership, the resulting preference which is lawful in the one instance is not made unlawful by its greater extent in the second instance. What are preferences from one point of view are discriminations to the opposite observer. But it must be obvious that a preference or a discrimination to be unlawful must be something more than the natural and necessary implications of lawful advantage.

"It is suggested that the evil lies in the suppression of knowledge of the actual selling price under cover of the Pittsburgh plus quotation and that if this cover were removed, the discrimination would be apparent. That is to argue that the illegality of the practice arises only with the consciousness of its use, whereas the practice must be continuously expressing its results even though those affected are ignorant of the cause. And these results speak for themselves.

"There is no law of which I am aware which requires a manufacturer to sell f.o.b. if he prefers to sell c.i.f. that is, to sell at the place of manufacture instead of delivered at his customer's warehouse. Or to sell from or at any particular mill. I am unable to find in law a warrant for holding that a delivered price policy is made unlawful because of the method used to calculate the selling price. And the results of this policy seem to me to be such as naturally and necessarily attend the antecedent legalized status. This being so, it simply means that these manifestations which are urged as indicative of unlawful action are outside the law, not that the causes which produce them are unlawful.

The Powers of the Commission

"That satisfaction of the legal requirements may be deemed to fall short of economic justification does not increase this commission's powers nor enlarge its duties. Economists of established reputation believe that the selling policy presently under consideration is capable of producing in kind practically all of the effects which this record illustrates. In the present instance it seems these effects are magnified by the dominance and strategic position of the respondent in steel production, by the fact that the product of the steel industry is the raw material of a subsequent industry, and that the respondent is engaged in both phases. Given the necessary quantity values in causation, it seems to be the economist's view that such effects as are here presented are inherent in the economic policy which is being used.

"If the applicants' contention is sound, there is no effective remedy short of a mill base for each unit of the respondent's organization and either f.o.b. sales or delivered sales from the nearest mill at the f.o.b. price plus actual freight. And it would require the same rule to be applied to transfers of material to subsidiaries as govern sales to independents. Naturally such a rule would have equal application to every other industry in the United States now using the uniform price delivered sales plan in interstate commerce.

Cannot Order Abandonment

"I do not believe that this commission can require the abandonment of the delivered sale price on a single base for the products of several mills under a single ownership, any more than it could require the owner of a single plant to give over the uniform delivered price on its single product. Nor by parity of reasoning could it compel the respondent to treat its units as separate plants and sell f.o.b. each mill. The negative definition of the commission's jurisdiction in the case of Warren, Jones and Gratz v. Federal Trade Commission 253 U. S. 421, seems to preclude such a possibility. This body must take the law as it is received from the hands of Congress and interpreted by the courts for whose supervision Congress made precise provision. The grant of power to this commission, however broad it may be in some aspects, does not extend to the correction of what, in its discretion, the commission may believe to be an economic mistake. If there is to be a remedy of effects whose cause is beyond the law, if there is to be so profound a change in established business practices as is here contended for, that responsibility lies upon the Congress because it alone has the power so to mould the common concept of public policy.

" 'The suggestion that if this view be applied, grave abuses may arise from the mistakes or wrongful exertion by the legislative department of its authority, but intimates that if the legislative power be permitted its full sway within its constitutional sphere, harm and wrong will follow and therefore it behooves the judiciary to apply a corrective by exceeding its own authority. But as was pointed out in Cary v. Curtis (How. 236) and as has been often since emphasized by this court (McCray v. United States 195 U. S. 27) the proposition but mistakenly assumes that the courts can alone be safely intrusted with power and that hence it is their duty to unlawfully exercise prerogatives which they have no right to exert, upon the assumption that wrong must be done to prevent wrong being accomplished.'—(Oceanic Navigation Co. v. Stranahan 214 U. S. 320.)

"Moreover it seems to me that the effort to apply a remedy through the Federal Trade Commission act confuses the issue. If the economists are right, the requirements of the situation will be met only by a legislative recognition of the necessity for a more exact statement of the scientific relation between business and economics and the declaration of that relation in the form of a law of general application.

"For these reasons I am unable to assent to the issue of the proposed order."

BOOK REVIEWS

Coke and Its Uses: in relation to smoke prevention and fuel economy. By E. W. L. Nicol. Pages 134, 7 x 9¾ in.; illustrations, 17 figures in the text, 11 plates. Published by the Van Nostrand Co., 8 Warren Street, New York. Price, $5.

In the earlier pages is a *résumé* of the advantages gained by carbonizing coal: high calorific intensity, valuable chemical by-products, as well as gas and oils that can (as can the residual coke) be burned efficiently and without smoke; the elimination of the volatile sulphur and—what for the industrial user is the most important—the obviation of introducing excess of air for the coke combustion.

The various processes of producing beehive, oven, low-temperature, gas and so-called "vertical" and "horizontal" coke are touched upon, as is its use in open grates, and analyses are given. Under the head of "Coke Lore" the prejudice against this fuel, and the skepticism in this connection, are combatted one by one, but not sufficiently concretely or forcibly to react upon the proverbial man "from Missourah." The late W. H. Booth's explanation of the advantages of this "single-stage" fuel, is quoted: that the superior thermal efficiency is due to the fact that in its combustion no water is formed, and therefore no heat rendered latent in the formation of steam.

There is an interesting description of the so-called "sandwich" system (burning coke and coal slack in superimposed layers) which might have been handled even more *in extenso*. The chain-grate system gets some attention.

Coke as fuel for hand-fired boilers is taken up from a British point of view; but our high American wages make hand firing very expensive, as owing to the more rapid combustion rate per square foot of grate, it takes more men for a battery than coal does. Data from the U. S. Bureau of Mines, showing the effects of thickness of fuel bed and air velocity on the combustion products, indicate that it is seldom advantageous to fire more than 6 in. thick. The tables of fuel cost, etc., are in British monetary units, and (supposedly) in long tons and imperial gallons; while the number of Lancashire and Cornish boilers used over here is comparatively so small as to lessen the value of the tables to American readers.

The author points out the gains by high-temperature treatment at gas-works; also by balanced draft: *i.e.*, a combination of forced and natural, or of forced and induced draft, so adjusted that a neutral atmosphere is maintained over the fire.

A coke-burning fire box is illustrated, and would be improved by having its upper edge grooved to contain a protective layer of ash.

Take it by and large, this work does not "fill a long-felt want"; first because the "want" has not existed, although a need has; and second because it covers the ground imperfectly.

Die Theorie der Eisen-Kohlenstoff-Legierungen. By E. Heyn and E. Wetzel. Pages 185, 6½ x 9⅝ in; illustrations, 103; tables xviii; plates xvi. Published by Julius Springer, Berlin.

For its size and for the highly educated engineer and metallurgical specialist, this is one of the most satisfactory works that has yet appeared in English, French or German. The 5-in. line is tiring to the eye, but against that Roman characters are used instead of the Gothic, which we call German.

The work very properly begins with the nomenclature now adopted in Germany for the most important kinds of iron compounds—a nomenclature in some respects clashing with ours, which latter, however, still finds considerable use in German iron and steel works, and still more in German workshops. Before reading the book it is necessary to note that the two principal divisions of the malleable irons are: that in which the material is formed in a paste and that in which it is formed in the fluid state; the first being a mixture of iron and slag, and each divided again into "iron" and "steel," according to hardness and ability to be hardened; whereas we make only one class of the two materials—iron—in fully liquid state. But when we get down to concrete figures and call the first-named German classes those with tensile strength under and over 4200 kg. per qcm. (roughly 60,000 lb. per sq. in.), and put the dividing line for the latter two at 5000 kg. per qcm. (say, 71,000 lb. per sq. in.) we have no uncertainty.

There is a very thorough representation of Pionchon's experiments as to the calories consumed in heating low-carbon irons to various temperatures, Osmond's explanation of the apparent discrepancy between the Pionchon theory and the fact of recalescence, that it is due to allotropy, and the Roberts-Austen tests with iron alloys of various carbon contents. The authors unite and reconcile all apparent discrepancies as being only slightly quantitative, and agreeing with the Carpenter and Keeling work.

The studies of Karsten, Caron, Rinman, Mueller, Abel, Osmond and Werth in eutectics are taken up to prove that there is a special carbon-iron alloy (a true chemical compound, carbide, Fe_3C) formed at, say, 700 deg. C. (the iron being replaceable by manganese and other elements) to which Howe gave the name cementite.

Following up such careful analyses of the steps which lead to thorough comprehension of the true nature of the various iron compounds at various temperatures, we see how it is possible to arrive at effective utilization of the alloying capabilities of iron with other elements, and to predicate the effect of each such alloying substance upon the iron and upon any possible others.

The graphic representations in this book are a joy to the eye in their clearness and consistent design, and the microchemical plates (unfortunately all at the end of the book, for typographical reasons) leave nothing to be desired as to variety and detail.

The bibliographical list shows extensive and judicious use of excellent and recent material. Perhaps Le Chatelier, Marco He, Bérehare, Evans, Atchison, Becker and others might have found more frequent quotation and reference; but as it is, more material is referred to than the average reader would find time to consult in two years.

Tests of marine boilers, as made under the auspices of the United States Bureau of Mines, are described in a 300-page bulletin, No. 214, issued by that bureau. Tests were initiated at the time the United States entered the World War and were made necessary because of ship-building requirements and the desirability of settling on standardized boiler practice along the lines of watertube boilers, which, because of their design, could be made with a small quantity of steel and could easily be transported from the inland points where manufacture was largely concentrated. After the armistice the tests were amplified to include Scotch boilers and a large amount of additional work was done. This bulletin, which is copiously illustrated, details both the original work and that which follows.

New Books Received

Hochdruckdampf. A compilation of several papers presented before the German Society of Engineers. Pages 108, 9 x 11½ in.; illustrations, 253. Published by V. D. I. Verlag, Beuthstrasse 7, Berlin S. W. 19, Germany. Price 9 marks.

Taschenbuch für Berg und Hüttenleute. By Prof Dr. Kögler. Pages 1477, 4¾ x 7½ in.; illustrations 810. Published by Wilhelm Ernst & Sohn, Wilhelmstrasse 90, Berlin W 66, Germany. Price, 21 gold marks.

U. S. War Surplus—Its Source and Disposition. By C. H. Lipsett. Pages 144, 6 x 9 in.; illustrated. Published by Atlas Publishing Co., Inc., 150 Lafayette Street, New York. Price, $3.

Der Ubersee-Maschinenhandel. By Wilhelm Thiemann. Pages 248, 6 x 9 in.; illustrations 14. Published by Julius Springer, Linkstrasse 23-24, Berlin W 9, Germany. Price, $2.65.

Machinery Markets and News of the Works

BUYING FOR JAPAN

General Electric Co. Places Orders for Milling Machines for Nippon Plant

Large Inquiries for Japanese Airplane Factory Come to the United States—Norfolk & Western Large Buyer

PERHAPS the most important development of the week is the placing of orders for milling machines by the General Electric Co., through Mitsui & Co., New York, for the plant of the Japanese General Electric Co. This is the beginning of the purchase of several hundred tools for the Japanese electrical plant. A Cincinnati milling machine company is reported to have received a large order. Orders for various other types of tools are expected to follow shortly.

Another interesting Japanese prospect comes to the United States in the form of inquiries for hundreds of tools for an airplane factory in that country. The lathes alone on the list total 172. These inquiries come from the Nakashima Trading Co. of Tokio. Little is known here of this company, hence the placing of the business in this country is still somewhat uncertain.

Cincinnati manufacturers report an improvement in sales in the past week, and while this report is not general in all selling centers, there are indications of a slightly increasing interest in the purchase of machine-shop equipment. The General Electric Co. has bought a number of tools for its domestic plants.

The Ford Motor Co., Detroit, has placed a number of orders, but otherwise the automobile industry is not figuring extensively on equipment at the moment.

Railroad buying has been featured by the purchase of the Norfolk & Western, now practically completed. Orders were widely distributed, and consequently have not been carefully checked, but it is assumed that this road bought most of the machines it inquired for a few months ago, its list numbering more than 70 tools.

School requirements are a matter of interest, the St. Louis Board of Education having completed the purchase of about 30 tools, and the Chicago Board of Education will probably take action this week on a list calling for an expenditure of about $100,000.

The crane market has been enlivened by an inquiry from the Bethlehem Steel Co. for 32 cranes of various types for extensions to its plants at Buffalo and Johnstown.

New York

NEW YORK, July 22.

A FEW offices report slightly better business in the past week, and also say that some inquiries, long dormant, are "coming to life." A good deal of the Norfolk & Western list has been purchased, and a local office has received orders from this road for two 48-in., 600-ton, double-end wheel presses, a 6-in. spindle horizontal floor borer and a cotter and keyseat milling machine, in addition to a driving wheel lathe reported a week ago. The Missouri Pacific Railroad has bought a 48-in. car-wheel borer and a 400-ton, double-end wheel press. The St. Louis-San Francisco Railroad has bought a 400-ton, single-end wheel press. This constitutes most of the railroad buying of importance during the week, but there has been a little increase in buying by industrial companies. The New Jersey Zinc Co. bought five machines; a western New York manufacturer bought four No. 3 Acme turret lathes; an electrical manufacturer ordered a No. 5 Baker Brothers' keyseater. Other orders follow: American Sheet & Tin Plate Co., Pittsburgh, 1500-lb. steam hammer; American Sugar Refining Co., a 30-in. x 22 ft., engine lathe; Hollingsworth & Whitney Co., Boston, a 36-in. x 18-ft. engine lathe; General Electric Co., for Harrison, N. J., a 22-in. x 7-ft. vertical surface grinder and two sensitive drilling machines.

Large inquiries for machine-tool equipment for an airplane factory to be built in Japan have reached this country, being sent out by the Nakashima Trading Co., Ltd., Tokio. The lists run into hundreds of tools, the engine lathes and turret lathes listed alone totaling 172 items. None of the information received here indicates whether it is a Government project or one backed by private interests.

Ovens, power equipment, conveying and other machinery will be installed in the four-story plant to be erected at 506-10 East Seventy-sixth Street, New York, by the Fink Bread Co., 438 East Seventy-second Street, estimated to cost $200,000, for which a general building contract has been let to the Fisher-Williams Corporation, Park Avenue.

Weinberger & Weishoff, Inc., 345 Madison Avenue, New York, architects and engineers, have plans for a five-story automobile service, repair and garage building, 97 x 100 ft., at 503-9 West 166th Street, estimated to cost $175,000 with equipment.

Plans have been filed by the International Motor Co., 25 Broadway, New York, for its proposed factory branch at Long Island City, three stories, 200 x 425 ft., to cost $700,000 with machinery. It will be used primarily for machine and repair work and for body manufacture. E. E. Seelye and J. H. Musselman, both at 101 Park Avenue, New York, are engineers.

The American Stove Co., 209 West Forty-third Street, New York, has awarded a general contract to the White Construction Co., 95 Madison Avenue, for a five-story and basement plant at 3012-20 Skillman Place, Long Island City, to cost more than $100,000 with equipment. Russell G. Cory, 30 Church Street, New York, is architect and engineer.

J. E. Fortune and A. Patri, Catedral 3024, Santiago de Chile, are desirous of getting in touch with American manufacturers of heating and lighting equipment, as well as tinplate and other materials.

The Associated Gas & Electric Co., 61 Broadway, New York, operating power plants and properties in New York, Massachusetts and other states, has issued bonds for $3,500,000, a portion of the proceeds to be used for extensions and improvements. J. I. Mange is president.

F. Van Dormark, 1023 State Street, Schenectady, N. Y., has awarded a general contract to Brown & Lowe, 361 Foster Avenue, for a two-story automobile service, repair and garage building, 35 x 145 ft., to cost about $45,000.

The Board of Education, Caldwell, N. J., plans the installation of manual training equipment in the proposed three-story high school estimated to cost $250,000, for which bids will be asked at once on a general contract. Starrett & Van Vleck, 8 West Fortieth Street, New York, are architects.

The Crane Co., 836 South Michigan Avenue, Chicago,

The Crane Market

Few awards of overhead or locomotive cranes have been made in the past week, but the inquiry of one company for overhead traveling cranes promises to establish the year's record for a single purchase. This is the list of the Bethlehem Steel Corporation, which calls for 16 overhead cranes of 10 tons capacity and one overhead crane of 20 tons capacity for Johnstown, Pa., and a total of 15 overhead cranes ranging up to 75 tons capacity for the Lackawanna plant at Buffalo. In locomotive cranes few purchases have been made and practically no new inquiries are noted. The American Steel & Wire Co., Worcester, Mass., has revised its inquiry for a 15-ton locomotive crane and now wants prices on both a 15-ton and a 20 to 25-ton crane, only one of which will be purchased. The locomotive crane inquiries of the Standard Oil Co. for Jersey City and the New York Central & Hudson River Railroad are still pending. The Atchison, Topeka & Santa Fe Railroad is in the market for a 15-ton electric traveling crane for its shops at Topeka. Thomas F. Carey, 120 Liberty Street, New York, dealer in railroad equipment, has inquired for a used 15-ton, 8-wheel locomotive crane, single or double drum, Browning preferred. The North State Lumber Co., P. O. Box 464, Charleston, S. C., is in the market for a used 8-wheel locomotive crane, about 15 tons capacity.

In the Pittsburgh district crane business is slack. It is a common assertion that business has not been so quiet in more than a year. Interest centers on the cranes and hoists for which the Westinghouse Air Brake Co., Wilmerding, Pa., inquired for some time ago.

Among recent purchases are:

Long Island Railroad, Jamaica, N. Y., six 20-ton hand power cranes from a mid-western crane builder.

United States Cast Iron Pipe Co., Burlington, N. J., a 5-ton electric traveling crane for Bessemer, Ala., from an unnamed builder.

Carter Oil Co., Parkersburg, W. Va., a 3-ton, 20-ft. 3-in. span, 3-motor, single I beam crane and an extra 3-ton electric hoist, from the Shepard Electric Crane & Hoist Co.

Newport News Shipbuilding & Dry Dock Co., Newport News, Va., a 3-ton, 23-ft. 3⅝-in. span, 3-motor, single I beam crane from the Shepard Electric Crane & Hoist Co.

Royal Piece Dye Works, Paterson, N. J., a 2-ton, 16-ft. span, underhung hand power crane on a 75-ft. runway; crane equipped with a 2-ton Yale & Towne electric hoist, from Manning, Maxwell & Moore.

Foundation Co., New York, a 20-ton used Brownhoist locomotive crane for the Southern Railway Co. Knoxville, Tenn., yards, from Philip T. King, New York.

Public Service Electric Co., Newark, N. J., a 35-ton used McMyler locomotive crane for use at Kearny, N. J., from Philip T. King, New York.

D. Connelly Boiler Co., Cleveland, a 25-ton overhead crane for use with a recently purchased riveting machine, from the Cleveland Crane & Engineering Co.

Elgin, Joliet & Eastern Railroad, a 5-ton, 3-motor bucket crane for Joliet, Ill., from the Milwaukee Electric Crane & Mfg. Co.

Columbus Bolt Works, Columbus, Ohio, two 5-ton electric traveling cranes, from the Whiting Corporation.

National Tube Co., Pittsburgh, for its Gary Works, a 1½-cu. yd., 2-line, 3-motor, 19-ft. span coal handling trolley, from the Cleveland Crane & Engineering Co.

is having plans drawn by Raymond Hood, 18 East Forty-first Street, New York, architect, for its proposed factory branch and distributing works on Irving Avenue, Ridgewood, Brooklyn, to be one-story, 80 x 275 ft., estimated to cost $60,000.

The Tottenville Copper Co., Tottenville, S. I., has filed plans for a one-story foundry.

Max Hausle, 3307 Third Avenue, New York, architect, has completed plans for a one-story automobile service, repair and garage building, 80 x 210 ft., on East 181st Street, to cost $160,000 with equipment.

The Empire Fire Proof Door Co., 435 Southern Boulevard, New York, has purchased adjoining property, 50 x 100 ft., and plans the erection of an addition.

Philadelphia

PHILADELPHIA, July 21.

THE Baldwin Locomotive Works, Inc., 500 North Broad Street, Philadelphia, has acquired the former plant of the Tindel-Morris Steel Co., Eddystone, Pa., adjoining its works, for use in connection with its expansion program, to include the removal of the Philadelphia plant to Eddystone. The property purchased consists of 10½ acres, with two main shops, 80 x 300 ft. and 40 x 230 ft., and two-story office, and was secured for $250,000.

Bids will be received by the Bureau of Supplies and Accounts, Navy Department, Washington, until Aug. 5, for 201 draft blowers for fuel oil burners, and 21 sets of spares for turbines and blowers, for the Philadelphia Navy Yard, schedule 2455.

C. M. Roswell, 1162 Marlyn Road, Philadelphia, machinery dealer, is in the market for one motor-generator set, 100 to 125 kw. capacity, 250 volts, three-phase, 60 cycle, or rotary converter for similar size and service; also, for one 10-ton, steam-operated road roller, and two or more, standard gage flat cars.

The Foss-Hughes Co., Twenty-first and Market Streets, Philadelphia, local representative for the Pierce Arrow Motor Car Co., has purchased property on Allegheny Avenue, 400 x 450 ft., as a site for a two-story service and repair building, estimated to cost $600,000 including land.

The Electric Storage Battery Co., Nineteenth and Allegheny Streets, Philadelphia, has awarded a general contract to the William Steele & Sons Co., 219 North Broad Street, for an addition to cost $110,000, including improvements in existing structures.

A one-story power house will be erected by the Lehigh Silk Hosiery Mills, Inc., D and Ontario Streets, Philadelphia, at its new plant at Butler and Jasper Streets, to cost $150,000, for which work will proceed at once.

Thomas M. Royal & Co., Bryn Mawr, Philadelphia, manufacturers of paper products, have acquired the former plant of the Fox Motor Car Co., at Seventh and Grange Streets, Olney, 290 x 530 ft., for $285,000, and propose to remodel the property for a paper mill.

The Foreign Trade Bureau, Philadelphia Commercial Museum, has received an inquiry (42458) from Gustaf Jaatinen, Wasa, Finland, who is in the market for hack-saw blades and desirous of getting in touch with American manufacturers; also an inquiry (42476) from Rijks Nijverheidsdienst, Keizerstraat 18, Deventer, Netherlands, desiring to get in touch with American manufacturers of automatic cutting and wrapping machines; an inquiry (42484) from Juan R. Asorey, Calle Calixto Garcia 16, Manzanillo, Cuba, interested in securing addresses of American manufacturers of wire fencing and netting, locks, hardware, iron and steel, tinplate, and other kindred products.

The Franklin Electric Co., 15 North Seventh Street, Philadelphia, electrical equipment and supplies, has acquired property at 50-52 North Seventh Street, 50 x 100 ft., for extensions.

Interests represented by Byron A. Milner, 1318 Real Estate Trust Building, Philadelphia, attorney, are organizing the Jackson Township, Jefferson Township, Rush Township and Wayne Township Electric companies, to install and operate power plants and systems for light and power service in the respective districts.

The Kellogg Radiator Corporation, Tamaqua, Pa., recently organized under Delaware laws by local interests, with capital of $800,000, has acquired the plant of the Atlas Powder Co., at Tamaqua, for $400,000. The new owner will take immediate possession and will remodel, retaining the present foundry for radiator castings. Plans are under way for the early erection of a one-story addition. The company will specialize in the manufacture of hot water and steam radiators.

The Pennsylvania Water & Power Co., Holtwood, Pa., is disposing of a bond issue of $1,000,000, the proceeds to be used in part in connection with the organization of the Holtwood Power Co., a subsidiary, and the preliminary work for a steam-operated electric generating plant, adjacent to its present hydroelectric power station at Holtwood, to have an initial capacity of 30,000 hp.

The Board of Education, Harrisburg, Pa., plans the installation of manual training equipment in the proposed John Harris high school to be erected in the Allison Hill section, to cost $400,000. Clayton J. Lappley, Harrisburg, is architect, associated with Henry F. Hornbostel, 63 William Street, New York, architect. C. H. Garwood is superintendent of schools.

The City Council, Glassboro, N. J., plans the installation of electric-operated pumping equipment in connection with its proposed new sewerage system, estimated to cost $300,000.

Buffalo

BUFFALO, July 21.

ALTHOUGH business is light it is somewhat more encouraging. Two dealers expect to close orders shortly which will run into good figures. Sales last week included a spot welder and two motor-driven tool room lathes. A few good inquiries are out for power saws, and some orders were booked for this type of machine.

Manual training and vocational departments will be installed in a new school to be erected at Gouverneur, N. Y., at a cost of $91,000, to replace a structure destroyed by fire on May 6. The Board of Education is in charge.

Contract has been awarded by Pratt & Letchworth, 189 Tonawanda Street, Buffalo, manufacturers of locomotive castings for a two-story addition estimated to cost $40,000, which will also be utilized as a coal crushing and powdering plant. Considerable equipment will be installed.

A general contract has been awarded to the Bancroft-Jones Co., Mutual Life Building, Buffalo, for a two-story, 84 x 84 ft., addition to the plant of the Fitzgibbons Boiler Co., Oswego, N. Y.

M. Joyce, 14 West Bennett Street, Buffalo, N. Y., is in the market for a vacuum pump and two 2000-lb. capacity electric elevators, also for Webster valves.

Manual training equipment will be installed in the new two-story high school to be erected at North Tonawanda, N. Y., estimated to cost $375,000, for which bids will be asked on general contract in August. Tooker & Marsh, 101 Park Avenue, New York, are architects.

The Kalman Steel Co., Mutual Life Building, Buffalo, is said to have tentative plans for extensions in its steel fabricating plants at Blasdell, N. Y., and Youngstown, Ohio, used largely for the production of bars for concrete reinforcement. The expansion is estimated to cost $200,000 including equipment.

The Fairport Cold Storage Co., 330 New Castle Road, Rochester, N. Y., has awarded a general contract to the Turner Construction Co., 11 Goodell Street, Buffalo, for a three-story ice and cold storage plant, 134 x 150 ft., at Fairport, N. Y., estimated to cost $300,000 with equipment. Charles Lathrop, Cutler Building, Rochester, is architect. Cogswell Bently is president.

The Eastman Kodak Co., 343 State Street, Rochester, N. Y., has awarded a general contract to the Ridge Construction Co., 335 Lewiston Avenue, for two additions to its plant, each four-story, 40 x 52 ft., and 40 x 60 ft., respectively, estimated to cost $70,000.

Manual training equipment will be installed in the proposed high school to be erected at Rome, N. Y., estimated to cost $400,000 for which bids will be asked on a general contract early in August. Tooker & Marsh, 101 Park Avenue, New York, are architects.

The S. A. Day Mfg. Co., 1483 Niagara Street, Buffalo, manufacturer of platers' equipment and supplies, will begin the erection of a one-story addition.

Pittsburgh

PITTSBURGH, July 21.

BUSINESS in machine tools in this district continues very light and fresh inquiries are few. The summer rarely is marked by much activity, but the season alone is not responsible for the dullness, since most of the inquiries which have been quoted on have been regarded as representing necessary requirements. Buyers are delaying purchases in the belief that they will do as well on prices later as now, and that the delay will afford a better line on the future for business.

The National Tube Co., has placed the stands for a 14-in. and a 16-in. skelp mill for Gary, Ind., and the mills, drives and motors will probably be let this week.

Dwight P. Robinson & Co., Inc., 125 East Forty-sixth Street, New York, has been engaged to design and construct an extension to the Seward, Pa., plant of the Penn Public Service Co., Johnstown, Pa. Purchases will include two new boilers equipped with pre-heaters, stokers and boiler feed pumps.

The American Steel & Wire Co., Frick Building, Pittsburgh, has had plans drawn for a two-story and basement building, 45 x 88 ft., at Donora, Pa. A. F. Bucklin is company engineer.

The Temple Motor Co., Chester, W. Va., will install a machine and repair shop on the second floor of its new two-story and basement service building, 42 x 65 ft., for which foundations will be laid at once.

Ovens, power equipment, conveying and other machinery will be installed in the new four-story plant, 78 x 100 ft., to be erected by the Hankey Baking Co., McKees Rocks, Pa., estimated to cost $125,000, for which a general contract has been awarded to Henry Busse & Co., Main and Wabash Streets, Pittsburgh. The McCormick Co., 127 South Negley Avenue, Pittsburgh, is architect and engineer.

The Franklin Valveless Engine Co., Franklin, Pa., has purchased the foundry of the French Creek Foundry Co., and will take immediate possession. The structure will be used for engine castings, replacing the foundry destroyed by fire last May with loss of about $125,000. Plans for rebuilding have now been abandoned. No announcement has been made regarding the plans of the French Creek Company.

R. M. and T. A. Crislip, Clarksburg, W. Va., have awarded a general contract to the Concrete Steel Bridge Co., 600 East Pike Street, for a six-story automobile service, repair and garage building 50 x 72 ft., estimated to cost $85,000.

The National Foundry Co., Erie, Pa., is disposing of a bond issue of $450,000, a portion of the proceeds to be used in connection with plant expansion, for which arrangements have been made. E. W. Sheldon is president.

New England

BOSTON, July 21.

WHILE New England's metal working industries, collectively, are evincing more life, they have by no means recovered from the recent depression and no general improvement is anticipated for a month or more. The cotton, woolen and shoe manufacturing industries lead in the recovery, and it is from machine shops maintained in these lines that the trade hopes to take the initiative.

Little improvement is noted in the movement of machine tools out of stock. The purchase of a 36 in. x 18 ft. geared head lathe by a Massachusetts paper manufacturer, and the immediate closing on a similar lathe together with several smaller ones, a bolt cutter and miscellaneous shop equipment were the principal sales. The purchase of a used punch, a new beveling machine and miscellaneous equipment by a Wollaston, Quincy, Mass., concern about to engage in the manufacture of stacks and similar light iron work, were also noted. Inquiries are even less numerous than a week ago. The used equipment market is more or less unsettled due to keen competition.

South Manchester, Conn., has awarded contract for a two-story and basement, 34 x 85 ft. trade school, to cost without equipment $85,000. L. H. Geer, Manchester, is the architect.

Foundations are in for a two-story, 60 x 120 ft. repair shop for the Star Auto Radiator Works, 33 Derby Street, Worcester, Mass. Harry Mandell is proprietor. Harry L. Meacham, 571 Main Street, that city, is the architect.

The Lynn Gas & Electric Co., Lynn, Mass., has awarded a contract for the construction of twenty-five by-product coke ovens, boiler house, etc., to cost $600,000. Plans are private. Coal handling equipment, motors, generators, transformers, boilers, two radial stacks, 9 x 125 ft. and 9 x 150 ft., as well as other equipment are required.

The United Illuminating Co., Bridgeport, Conn., is planning to make an addition to its present 30,000 kw. Steel Point station, approximately the same size as the present buildings, and will contain the boiler room, turbine room and switch house. No mechanical or electrical equipment will be installed at this time. Westcott & Mapes, Inc., New Haven, Conn., is the designing and supervising engineer.

The Hayes Electric Co., 34 Taylor Street, Springfield, Mass., has awarded a general contract to E. J. Pinney, Inc., 374 Main Street, for a three-story and basement building, 50 x 98 ft., estimated to cost $47,000. B. E. Geckler, 335 St. James Avenue, is architect.

The Bridgeport Safety Emery Wheel Co., Bridgeport, Conn., will lay foundations at once for a one-story factory at Stratford, Conn., 90 & 240 ft., estimated to cost $42,000. A general contract has been let to William Muirhead & Son, Bridgeport. V. W. Tarnay, Bridgeport, is architect.

The Common Council, West Newbury, Mass., has preliminary plans for a municipal electric light and power

house, estimated to cost $40,000. J. D. Ring is chairman of the committee in charge.

The Garford Motor Truck Co., Inc., 900 Commonwealth Avenue, Boston, is considering the erection of a two-story service and repair works at Brighton, Mass., to cost approximately $130,000 including equipment.

H. R. Leach, Providence, R. I., manufacturer of jewelry parts, has awarded a general contract to the Balchin Construction Co., 75 Westminster Street, for a one-story factory, 56 x 75 ft. Jackson, Robertson & Adams, 1216 Turks Head Building, are architects.

E. C. Ford, Norwich, Conn., is having plans drawn for a two-story automobile service, repair and garage building, 60 x 110 ft., at New London, Conn., to cost approximately $50,000 with equipment. Francis DeGrange, 28 Ocean Avenue, New London, is architect.

Cleveland

CLEVELAND, July 21.

THE machine tool market continues quiet, with the volume of sales about equal to those of the few previous weeks. Business is limited for the most part to single machines and most of the buying is being done by small machine shops. Two orders from railroads were placed with local manufacturers during the week, one from the Santa Fe for a drilling machine and one from the Missouri Pacific for a turret lathe. The New York Central has sent out a new inquiry for three or four machines for its Gibson, Ind., shops. The Cleveland Board of Education purchased several machines for the Collinwood High School, recently inquired for.

A local manufacturer received an order from the Swedish navy for an automatic screw machine and orders for two molding machines came from France. A Cleveland manufacturer of gear making machinery reports a good volume of sales, including considerable export business. Cranes are quiet but makers of hoists report an improvement in orders this month.

The White Motor Co., Cleveland, has taken bids for the general contract for its new two-story and basement factory, 70 x 280 ft. to cost $200,000. The Watson Co., 4604 Prospect Avenue, is the engineer.

A central steam heating plant will be required in connection with a group of buildings to be erected by the Cleveland Protestant Orphan Asylum. Charles W. Hopkinson, 900 Rose Building, is the architect.

The Board of Education, Dillonvale, Jefferson County, Ohio, will take bids Aug. 12 for a high school to include a manual training department. Forest E. Rusk, 16 South Third Street, Columbus, is the architect.

Willard, Ohio, is having plans prepared for a $100,000 electric light plant for which it will vote on a bond issue in August. Forelich & Emery, Second National Bank Building, Toledo, Ohio, are the electrical engineers.

The Columbus, Delaware & Marion Electric Co., Marion, Ohio, contemplates the installation of a 15,000 kva., three phase, 13,200 volt turbine, with auxiliary equipment. L. Stang is superintendent.

Detroit

DETROIT, July 21.

BIDS are being asked on a general contract by the Detroit Grey Iron Foundry Co., Wight and Iron Streets, Detroit, for a one-story addition, 50 x 82 ft., for which plans have been drawn by Mildrier & Eisen, Hammond Building, Detroit, architects.

The Electric Light & Water Department, Lansing, Mich., has awarded a general contract to the Reiniger Construction Co., Lansing, for a one-story service and machine shop, estimated to cost $115,000 with machinery. A portion of the structure will be reserved for storage.

The Commonwealth Stamping Co., 5930 Commonwealth Avenue, Detroit, is considering the installation of a press for the production of small metal stampings and other equipment.

The Fenton Machine Tool & Die Co., Fenton, Mich., is considering the erection of a one-story plant, 90 x 159 ft., estimated to cost $52,000. A. W. Westman is president and general manager.

The Board of Education, Hamtramck, Mich., has awarded a general contract to Walter H. Mueller, Detroit, for a three-story and basement junior vocational high school on Hewitt Avenue, estimated to cost $480,000 with equipment. J. G. Kastler & Co., Detroit Savings Bank Building, Detroit, is architect.

The Knight Screw Products Co., 6510 Epworth Boulevard, Detroit, is said to be planning the installation of an automatic screw machine and other equipment.

O. R. Dickerson & Co., 29 Market Street, Mount Clemens, Mich., is considering the erection of a two-story automobile service, repair and garage building, estimated to cost $60,000, with equipment.

The Service Co. of Grand Rapids, Inc., organized to rebuild wrecked automobile bodies, manufacture body parts and to do general body work from the chassis up, is in the market for equipment. N. Heyns is one of the principals.

The Dachel-Carter Boat Co., Benton Harbor, Mich., recently organized with capital stock of $50,000 as designer and builder of pleasure and commercial craft, has been awarded contract by the United States Coast Guard for ten 75-ft. patrol boats which are now under construction. The company is in the market for material used in building and equipping these craft. A. B. Carter is president.

Chicago

CHICAGO, July 21.

IN an exceedingly quiet market the chief source of interest remains the extensive local school list, now in the hands of the Committee on Buildings and Grounds of the Board of Education. A meeting of this body was postponed from last week to the current week, when it is expected that the proposition will come up for final disposition. The list, if bought, will involve an expenditure of $100,000. Sharply curtailed operations in both industrial plants and railroad shops are discouraging purchases of equipment. However, a railroad car builder is still expected to place a few orders in addition to recent purchases. Among the railroads, the Santa Fe has placed an order for a power squaring shear, but is not yet ready to take action on its large list of long standing.

Sales of used equipment have been heavier of late than orders for new machines, evidently reflecting the desire of buyers to obtain bargains. In view of the flexibility of quotations on new equipment, however, even those users who are primarily interested in price are increasingly cautious about placing orders for second-hand tools until they have thoroughly investigated the possibilities in new machines.

The Northern Pacific Railway is reported to be preparing to reopen its foundry at Brainerd, Minn., which was closed about two years ago. It is expected that brass casting will start Aug. 1 and iron foundry operations may follow later.

George D. Vargason and John Muir, Fort Benton, Mont., have taken possession of a former warehouse in that city and are equipping it for an iron foundry.

The Sioux City Terminal Co., Sioux City, Iowa, is constructing a machine shop and engine shed to cost $100,000. The building will house six locomotives and equipment for repairing and maintaining the company's rolling stock.

The Union Furniture Co., Batesville, Ind., has awarded contract for a three-story factory to cost $60,000.

The Kinzie Building Corporation, care D. S. Klafter, 64 West Randolph Street, Chicago, architect, is having plans prepared for a five-story garage, 98 x 141 ft., at 925 Kinzie Street, to cost $250,000.

The Pines Winterfront Co., 404-412 North Sacramento Street, Chicago, has awarded contract for a two-story addition to cost $82,000. It manufactures automatic radiator shutters, a line of spare tire and steel wheel locks and automobile bumpers. The name of the company was incorrectly given last week as the Pines & Wintergrant Co.

The H. D. Johnson Piano Co., Bellevue, Iowa, has authorized plans for a new factory, estimated to cost $200,000 with machinery, to replace the plant recently partially destroyed by fire. H. D. Johnson is president.

The Domestic and Foreign Commerce Department, Chicago Association of Commerce, 10 South La Salle Street, has received an inquiry (3029) from a company at London, England, in the market for ice cream freezers, baking ovens, oil cooking stoves, water heaters, etc., desiring to get in touch with American manufacturers.

The Common Council, New Prague, Minn., has preliminary plans for extensions and improvements in the municipal electric light and power plant, including the installation of additional equipment.

The Tuthill Spring Co., 760 West Polk Street, Chicago, manufacturer of automobile springs, has awarded a general contract to the Great Lakes Construction Co., 308 South Wabash Avenue, for a one-story service and repair works, 80 x 130 ft. Lowe & Bollenbacker, 108 South La Salle Street, are architects.

D. C. Briggs, city auditor, Miller, S. D., will take bids until July 30, for an addition to the municipal electric light plant, including equipment. Earle D. Jackson, St. Paul, Minn., is consulting engineer.

E. F. Houghton & Co., Philadelphia, oils and leathers for industrial use, have awarded the Austin Co., Cleveland, contract for additions to their Chicago branch plant. The new units include a compounding building, one-story with basement and a two-story mill type building, 85 x 100 ft.

St. Louis

ST. LOUIS, July 19.

BIDS will be received by the supervising architect, Treasury Department, Washington, until Aug. 5 for one motor-driven turbine pump and motor-driven air compressor for installation at the Post Office, St. Louis.

Manual training equipment will be installed in the new Westport junior high school, six stories, 125 x 200 ft., Kansas City, Mo., estimated to cost $850,000, on which construction is in progress. Charles A. Smith, Finance Building, is architect.

The Arkansas Utilities Co., Paragould, Ark., is completing plans for enlargements in the generating plant of the Arkansas Light & Power Co., recently acquired, including the installation of additional equipment.

The Skelton Lead & Zinc Co., Joplin, Mo., will begin rebuilding the portion of its central power plant recently destroyed by fire with loss, including gas engines, air compressors and auxiliary apparatus, reported at $150,000.

The Common Council, Knobnoster, Mo., plans the installation of pumping equipment, with steel tank and tower, in connection with proposed waterworks extensions, estimated to cost $40,000. The Shockley Engineering Co., Graphic Arts Building, Kansas City, Mo., is engineer.

The Hawkeye Zinc Co., Miami, Okla., recently formed with a capital of $200,000, has plans under way for the installation of a plant at its local properties to cost $75,000. A. O. Wallace, Miami, is one of the heads of the company.

Fire, July 12, destroyed a portion of the plant of the White & Hummel Mfg. Co 2800 West Second Avenue, Pine Bluff, Ark., with loss estimated at $30,000 including equipment. It is planned to rebuild.

The Common Council, Batesville, Ark., is having plans drawn for the installation of a pumping plant at the municipal waterworks in conjunction with a new filtration plant. The entire work will cost approximately $100,000. V. V. Long & Co., Colcord Building, Oklahoma City, Okla., are engineers.

The Williamsport Wire Rope Co., Williamsport, Pa., has plans for a one-story factory branch and distributing works on Fourth Street, Tulsa, Okla., 70 x 150 ft. Local offices are at 814 Kennedy Building.

The Thane Lumber Co., Arkansas City, Ark., is reported to be planning to rebuild the portion of its mill and yards destroyed by fire July 6 with loss estimated at $150,000 including equipment.

The United States Water & Steam Supply Co., 1315 West Twelfth Street, Kansas City, Mo., H. S. Ferguson, president, has awarded a general contract to Peter Larson, 404 Oak Street, for a two-story and basement distributing plant and shop at 1719-25 Locust Avenue estimated to cost $65,000.

Bids will be received in August by E. H. Williams, Mountain Grove, Mo., for a steam-operated electric power plant and distributing system estimated to cost $125,000, for which plans have been prepared by the Alexander Engineering Co., Woodruff Building, Springfield, Mo.

The American Salt & Coal Co., 1309 Weldheim Building, Kansas City, Mo., is planning an early call for bids on general contract for the erection of its proposed salt producing plant at Lyons, Kan., estimated to cost $850,000 with machinery. A power plant is proposed.

The Evans Electrical Constructing Co., care of George Horn, 704 Shukert Building, Kansas City, Mo., has been organized to engage in electrical construction. It is in the market for equipment. Later the company will take on lines of electrical equipment.

Cincinnati

CINCINNATI, July 21.

MACHINE tool sales show improvement and a number of manufacturers report total orders to date this month greater than for the entire month of June. Business seems to be developing from unexpected sources. The Norfolk & Western has practically completed its purchases, orders being widely distributed. The General Electric Co. has commenced buying for its Japanese plant, having placed a large order for milling machines, besides a number of tools for domestic plants. The St. Louis Board of Education has purchased tools for a manual training school, including 30 machine tools as well as shop accessories. The Burlington Railroad is said to have placed a fairly large number of lathes with a local builder. The Ford Motor Co. was a buyer during the week, the order being the only one of consequence from the automobile industry. Orders for small tools continue in fair volume, although most of the business is for replacement purposes, new projects being scarce.

The International Steel Wood Co., Springfield, Ohio, has definitely decided to locate its plant for the manufacture of steel wool in Chicago, property near Forty-seventh and Kedzie Streets having been acquired. J. K. Williams, president of the Ridgely-Trimmer Co., Springfield, Ohio, is president of the new company.

The city of Newport, Ky, is taking bids until July 29 for a 6,000,000-gal. pump for its waterworks plant. Herbert K. Flutmus is Commissioner of Public Property.

The Premier Rubber Mfg. Co., Dayton, Ohio, is preparing plans for a new factory to cost with equipment $250,000.

The Ohio Portland Cement Co., recently organized, has awarded a contract to the Bellefontaine Bridge & Steel Co. for a plant near Dayton, Ohio. The company contemplates the expenditure of $2,000,000 for works and equipment. Edward Bascom, Niles, Mich., is head of the company.

The Union Gas & Electric Co., Fourth and Plum Streets, Cincinnati, has filed plans for a seven-story automatic power substation at 27-29 Ogden Place, estimated to cost $130,000 with equipment.

The Gause-Beard Plywood Co., 171 Mallory Avenue, Memphis, Tenn., lately organized to take over a local works, will begin the erection of a one-story addition, 300 x 400 ft. The installation will include presses, saws, sanders, etc. The plant was formerly run under the name of the Waterproof Plywood Co.

The Common Council, Somerville, Tenn., has tentative plans for rebuilding the portion of its municipal electric power plant recently destroyed by fire.

The City Council, Ashland, Ky., contemplates the installation of electric-operated pumping equipment in connection with extensions and improvements in the municipal waterworks, for which a bond issue of $300,000 is being arranged. H. L. Carroll is city clerk.

The Mills Equipment Corporation, Volunteer Life Building, Chattanooga, Tenn., machinery dealer, is in the market for a 20-ton industrial locomotive, 36 in. gage.

The Sun Paint Pigment Co., Knoxville, Tenn., recently organized with a capital of $150,000, will erect a new plant at Sparta for the production of paint pigments. It is purposed to install electric-operated equipment. Oliver W. Hill, 520 West Church Street, is one of the heads of the company.

The Foundation Co., New York, has signed a contract with the Southern Railway Co. for the design and construction of the John Sevier yard near Knoxville, Tenn. The work under the contract covers the construction of a gravity classification yard, a 34-stall round house, machine shop, power house, cinder pits, freight transfer sheds, offices, stock pens, turntable, dwellings, track scales, culverts, bridges, retaining walls, grading, drainage, water supply and fire protection, signal system, a large amount of track work, together with appurtenant buildings, equipment, etc. The contract involves the construction of some 51 miles of standard gage track, and the development is so planned that it may be extended at a future date. The new classification yard will be about 3 miles long and will have a capacity of 2929 cars. The Foundation Co. is preparing the plans, drawings, designs and specifications and will begin actual construction shortly. A temporary camp to take care of 400 men is being established. The work under the present contract will be completed in about a year.

Indiana

INDIANAPOLIS, July 21.

ARRANGEMENTS for purchase have been concluded by the Westinghouse Electric & Mfg. Co., East Pittsburgh, of the concrete post manufacturing division of George Cutter & Co., South Bend, Ind., manufacturers of lighting equipment. It has also acquired the similar plant of the Massey Concrete Products Co., Milwaukee, and purposes to consolidate the interests.

S. C. Dennis, Guilford, Ind., has inquiries out for lathes, drilling tools, power hammers and other machine tools.

The Board of Education, Terre Haute, Ind., has awarded a general contract to the North-Raffin Co., Seventh and Ohio Streets, for proposed extensions and improvements in the three-story vocational school at Locust and Thirteenth Streets, 56 x 100 ft., estimated to cost $50,000. Johnson, Miller, Miller & Yeager, 30 North Fifth Street, are architects.

The Indiana Pattern & Model Co., Laporte, Ind., manufacturer of metal and wood patterns, etc., has awarded a general contract to the Griewank Brothers Construction Co., Laporte, for a one-story addition, 50 x 80 ft. Otto Conrad is general manager.

The Interstate Public Service Co., Indianapolis, has secured permission to issue bonds for $1,362,500, the proceeds to be used for extensions and improvements in power plants and system.

The Fort Wayne Corrugated Paper Co., Fort Wayne, Ind., has awarded a general contract to the G. W. Heinzemann Sons Construction Co., Marion, Ind., for its proposed plant at Hartford City, Ind., to be one and two stories, 180 x 350 ft., to cost $250,000 with machinery.

John Hagel, 2632 East Tenth Street, Indianapolis, architect, has plans for a three-story and basement automobile service, repair and garage building, 60 x 195 ft., at Alabama and Market Streets, estimated to cost $75,000 with equipment.

The Negro Industrial School, Evansville, Ind., W. M. Pruitt, chairman, has preliminary plans for a new industrial and manual training school near the city limits, estimated to cost $75,000.

South Atlantic States

BALTIMORE, July 21.

THE general purchasing officer, Panama Canal, Washington, will take bids until July 30 for machine screws, staples, tacks, escutcheon pins, oil cans, casters, steel tires, step ladders and other equipment, schedule 1621.

The Waterwee Power Co., Charlotte, N. C., an interest of the Southern Power Co., will begin the erection of a hydroelectric power plant on the Catawba River, about 20 miles from Charlotte. It will cost in excess of $600,000 with machinery. Contracts are being awarded for prime movers and certain electrical equipment. W. S. Lee is chief engineer.

The Herfurth Engine & Machinery Co., Camden, S. C., machinery dealer, is in the market for an oil-operated engine, 50 to 75 hp., with accessory equipment; also an ammonia compressor, 10 x 10 in., belt-driven type.

James McGuire, 115 Drayton Street, Savannah, Ga., is in the market for vacuum cleaning tools and is desirous of getting in touch with manufacturers.

The Charles Warner Co., Wilmington, Del., operator of sand and gravel properties, etc., has acquired the plant of the Penn Sand & Gravel Co., on the Delaware River, vicinity of Tullytown, Pa. Extensions will be made in the Penn plant, which will be operated in conjunction with the large mining, handling and shipping plant to be installed at Tullytown. It is expected to have machinery placed for operations in October.

The Logan-Long Co., Chicago, manufacturer of roofing products, has awarded a general contract to McKeown Brothers Co., 112 West Adams Street, for a branch plant at Atlanta, Ga., estimated to cost $250,000 with machinery. The company is now operating a plant at Franklin, Ohio, which will be maintained in service.

The United States Veterans Bureau, Room 791 Arlington Building, Washington, is taking bids until Aug. 12 for the construction of a boiler house, water tank, etc., at the United States Veterans' Hospital No. 48, Atlanta, Ga. Frank T. Hines is director.

Following the purchase of the power plant of the Snow Hill Electric Light & Power Co., by the Common Council, Snow Hill, Md., to be operated in the future as municipal property, plans are being arranged for extensions and the installation of additional water-power and electrical equipment, as well as pumping machinery. Work will begin early in the fall.

W. W. Kirkley, 112 Jackson Avenue, North Augusta, S. C., is planning the early purchase of machinery for sand-mining. Conveying and loading equipment will also be installed.

The Common Council, Clinton, S. C., is arranging a bond issue of $70,000 for extensions in the municipal waterworks, to include the installation of a pumping plant, with daily output of 1,000,000 gal. An engineer will soon be selected to prepare plans and bids for equipment asked in August.

The Carolina Standard Gas Products Co., 256 Clinton Avenue, Atlanta, Ga., Philip W. Wilcox, president, is completing plans for the erection of new works at Charlotte, N. C., for the manufacture of commercial oxygen, industrial gases, etc., to cost approximately $130,000 with machinery.

The Roanoke Concrete Pipe Co., Roanoke, Va., recently formed with a capital of $250,000, is said to be arranging for the establishment of a plant to manufacture concrete pipe and other cement products. G. D. Dhippiett is president.

Charles E. Lambert, 515 South Teyon Street, Charlotte, N. C., has plans for a two-story automobile service, repair and garage building, 42 x 200 ft., estimated to cost $60,000 with equipment.

The Dixie Cake Co., Spartanburg, S. C., is planning the installation of a refrigerating plant at its proposed two-story and basement factory for which plans are being completed.

The Board of Awards, office of the City Register, City Hall, Baltimore, will take bids until July 30 for one 75-hp. motor and centrifugal pump, complete with accessories. Specifications on file at the office of Bernard L. Crozier, highways engineer, Room 10, City Hall.

The Town Council, Wilson, N. C., has authorized the purchase of dredging machinery for municipal work. Theodore A. Hinnant is town clerk.

The Augusta-Aiken Railway & Electric Co., Augusta, Ga., for its subsidiary, the Georgia-Carolina Power Co., has engaged the J. G. White Engineering Corporation, New York, for the purchase, design and construction of the following additions to its plant on Stevens Creek near Augusta, Ga.: Extension of power house, including power house substructure, gates, racks, etc.; power house superstructure; hydroelectric apparatus consisting of one 3125-hp. turbine and one governor and electrical apparatus consisting of one 2700 kva. generator, and switchboard. Work will be started immediately.

Gulf States

BIRMINGHAM, July 21.

PLANS are being completed by the Fortuna Oil Co., Shreveport, La., for the construction of a gas pumping plant about 3 miles from Bethany, Tex., to cost approximately $200,000 with equipment. Work has been started on a one-story machine and repair works and distributing plant on the Mansfield Road, Shreveport, for care of company machinery, parts manufacture, etc., to cost $100,000 with equipment.

A power plant will be constructed at the proposed mill to be established by the Bastrop Cotton Mills, Inc., Bastrop, Tex., recently organized, estimated to cost $350,000 with machinery. The company is capitalized at $500,000. Frank L. Denison, Temple, Tex., heads the organization.

G. P. Lawrence, P. O. Box 74, Lantana, Fla., is planning to purchase machinery for an electric light and waterworks, full automatic type.

The United States Engineer Office, Florence, Ala., will take bids until Aug. 1 for iron and steel castings for the lock gates at the Wilson Dam, Tennessee River.

The Kirby Lumber Co., Commercial National Bank Building, Houston, Tex., is completing plans for the erection of a new mill in the vicinity of Call, Tex., estimated to cost $70,000 with equipment.

A refrigerating plant will be installed in the new one-story meat-packing house to be erected by the Dallas Packing Co., Dallas, Tex., at 4911 Rock Island Avenue, estimated to cost $100,000, for which plans are being completed. The present plant at 705 Ross Avenue will be continued for certain lines.

The Waco-Curton Plow Co., Waco, Tex., recently organized with a capital of $30,000, is contemplating the establishment of a plant for the manufacture of disk plows and other agricultural equipment. J. E. Curton, 817 Dallas Street, is president and general manager.

Gilbert D. Von Phul, Carondelet Building, New Orleans, has inquiries out for an air compressor with capacity of about 300 cu. ft. per min., steam-driven, duplex or tandem, two-stage.

The General Motors Truck Corporation, Dallas, Tex., has arranged for the construction of a one-story service, repair and garage building on Commerce Street, 100 x 216 ft., estimated to cost $50,000 including equipment. J. A. Pitzinger, Dallas, is architect. J. A. McDaniel is Southwestern district manager for the truck company.

The Magnolia Gas Co., Beaumont, Tex., contemplates the installation of two pumping plants for booster service at DeBerry and Pineland, respectively, in connection with its new 200-mile pipe line now in course of construction from northwestern Louisiana to Beaumont. Fred M. Lege, Jr., is president.

The Seaboard Oil & Refining Co., Orange, Tex., has plans for an addition to its oil refinery, estimated to cost $80,000 with machinery. A. C. White, general manager, Sycamore Oil Co., Orange, is in charge.

The Miller Cotton Mills, Inc., Waco, Tex., plans the construction of a power house at its proposed new textile plant, estimated to cost $500,000 with machinery, of which the majority will be electrically-operated. The C. R. Miller Mfg. Co., Dallas, Tex., C. R. Miller, president, operates the company.

George E. Merrick, Miami, Fla., and associates, are completing arrangements for a new ice-manufacturing plant, estimated to cost $150,000 with machinery. The equipment will be electrically-operated. Contracts for prime movers have been placed and orders for other equipment will soon be given out.

The Gas & By-Products Co., Dallas, Tex., is disposing of a bond issue of $250,000, a portion of the proceeds to be used for extensions and improvements, including additional equipment. The total bond issue will be $3,000,000. H. C. Morris is vice-president.

Henry A. Mentz, Magnolia, Miss., engineer, will prepare plans and specifications for a 1,500,000-gal. pumping plant for the City of DeRidder, La., for which electrical pumping machinery and equipment will be required.

Milwaukee

MILWAUKEE, July 21.

DULLNESS continues in the machine-tool trade, but inquiry has improved somewhat and orders are again being placed, although in small number and from widely scattered sources. July business summaries speak of a fairly well defined trend toward improvement in the automotive parts and equipment industries. Iron and steel foundries are reported to be much below their normal operation. Farm implement manufacture held about even with the first half of 1923, and prospects for the last half are said to be much better.

The Lakeside Bridge & Steel Co., North Milwaukee, Wis., is erecting an addition which will increase the capacity from 1500 to 2000 tons a month about Sept. 1. The company is fabricating and erecting its own steel and building three new cranes. The extension is 175 x 400 ft., and duplicates the present shop in size. Orders have been placed for machinery and other equipment. Charles G. Margwarth is vice-president and general manager.

The Briggs & Stratton Co., 1047 Louis Avenue, Milwaukee, manufacturer of automotive electrical devices and hardware, has reincorporated in Delaware under the name of the Briggs & Stratton Corporation. No additions are contemplated at present, but some new equipment is being purchased from time to time for replacement and small enlargements of departmental capacity. Stephen F. Briggs is president and general manager.

The Ley Co., Boston, Mass., has contracted with the Watson Co., 210 Sycamore Street, Milwaukee, to design and erect a new coal handling bridge, which requires 300 tons of steel, being fabricated by the Worden-Allen Co., Milwaukee.

The Stotzer Granite Co., 723 Grand Avenue, Milwaukee, is erecting additions costing about $60,000 to its monument works at Portage, Wis. The main extension is 44 x 180 ft., with a craneway. New polishing wheels, surface cutters and a number of pneumatic tools are being purchased. Oscar F. Stotzer is president and general manager. L. O. Mueller is general superintendent at Portage.

The Wisconsin Veneer Co., Rhinelander, Wis., has plans for a one-story addition, 60 x 90 ft., to its boiler house and is inquiring for equipment. The investment will be about $30,000. F. A. Marshall is general manager.

The Lafayette Motors Corporation, Milwaukee, affiliated with the Nash Motors Co., Kenosha, Wis., expects to do some retooling to facilitate a change in the design of its product, which will be materially lightened in weight and built for a substantial reduction in selling price from the present 100 hp. eight-cylinder car. James C. Wilson is general manager.

The Garber Iron & Metal Co., Wisconsin Rapids, Wis., wholesale dealer in scrap metals and waste materials, will build a three-story brick and tile warehouse and handling plant, 60 x 150 ft., and will purchase some crane equipment, welding and cutting tools, etc. Frank Garber is president.

The new plant to be erected for Edward A. Julien, 208 Grand Avenue, Wauwatosa, Wis., at 1656-1662 Holton Street, Milwaukee, will be a brass foundry and machine shop, requiring a full complement of equipment. The building will be 50 x 100 ft., one story.

Pacific Coast

SAN FRANCISCO, July 16.

PLANS are under consideration by the Paramount Motors Co., California Bank Building, Los Angeles, for the erection of a new plant near Los Angeles, estimated to cost $100,000 with machinery. Fred S. Lack is president.

The Pacific Gas & Electric Co., 445 Sutter Street, San Francisco, has authorized plans for new works for equipment construction and repairs at Emeryville, Cal., to consist of foundry, machine shop, electrical shops, laboratory, etc. An appropriation of $823,800 has been made for the plant and equipment.

The Northwestern Electric Co., Pittock Building, Portland, has tentative plans under way for three automatic power substations, estimated to cost $131,000 with equipment.

The Oro Grande Cement Co., Los Angeles, has engaged A. L. Acker, 445 Douglas Building, architect, to prepare plans for a new mixing plant in the Beverly Hills district, one-story, 40 x 100 ft.

The Los Angeles Gas & Electric Corporation, Los Angeles, is disposing of a new preferred stock issue of $5,000,000, a portion of the proceeds to be used for extensions and improvements.

The Moller Auto Sales Co., Sacramento, Cal., is having plans prepared for a four-story service, repair and garage building, to cost approximately $100,000 with equipment. Jens C. Petersen, Peoples Bank Building, is architect.

The Magnacrete Shingle Co., San Francisco, has leased a two-story factory to be erected by the Lurie Co., 315 Montgomery Street, to cost $45,000, and will equip for the manufacture of concrete shingles and kindred products. O'Brien Brothers, 315 Montgomery Street, are architects.

The Great Western Motor Co., San Jose, Cal., has taken title to the plant of the National Axle Corporation, Oakland Highway, for the manufacture of motor tractors, parts, etc., with assembling department.

The Continental Oil Co., Payette, Idaho, is in the market for two rotary pumps and a gas engine. A. M. Foot is superintendent.

Canada

TORONTO, July 21.

DEMAND for machine tools in this market is holding well. The Canadian National Railways have recently placed orders for tools and are still in the market for additional equipment for its Montreal shops. The Canadian Pacific Railway will make some purchases, but no large lists are expected from this source. During the week the Preston Woodworking Co., Preston, Ont., received an order for 10 tools for the Owen Sound Technical School. Inquiries are coming forward freely and selling interests express the opinion that a steady demand for practically all classes of tools will continue for some time.

E. Hubert, Beloeil, Que., is in the market for machinery and complete equipment for a sash and door manufacturing plant.

The Builders' Iron Works, West Montreal, is in the market for foundry equipment. F. C. E. Burnett, 8 Westminster Avenue, Montreal, is engineer.

Deguire & Frere, 11 Prince Street, Sorel, Que., are asking for a lathe and drill press.

I. Queeneville, St. Lawrence Street, Valleyfield, Que., is interested in the purchase of equipment for a machine shop.

J. M. Smith, Foster Square, Waterloo, Que., is in the market for a drill press, air compressor, emery grinder, etc.

The Ottawa Electric Co., Ottawa, Ont., is preparing to construct a power development plant to cost $100,000.

The Walsh Electric Co., 465 Church Street, Toronto, will build an addition to its factory, for which bids are being received by B. Richardson, architect, 632 Church Street.

The Public Utilities Commission, Port Arthur, Ont., is contemplating the location of a permanent distribution station, with complete machinery and equipment, at Bear Point, Ont., in connection with the hydroelectric development plant at Cameron Falls.

Western Canada

The plant of the Desjardins Co., Saskatoon, Sask., manufacturer of agricultural implements, was destroyed by fire, July 9, with a loss to building and machinery of $76,000. It is expected to rebuild.

John Hanbury & Co., False Creek, B. C., are completing plans for the erection of a sawmill and dry kilns at Vancouver, B. C., to cost $300,000.

The city of Vancouver, B. C., has awarded the general contract to the Dominion Construction Co. for the erection of a machine shop at the Camble Street Civic Yards to cost $15,500. Equipment has not yet been purchased.

Plans of New Companies

Bradley Process, Inc., 15 Park Row, New York, incorporated with $100,000 capital stock to manufacture special machinery to be used in refining minerals, will spend five or six months in experimental work, at the close of which it is expected the company will undertake manufacturing. Its plant will be located in the best available place, but preferably in the vicinity of New York. A. J. Smith and J. Bradley are the incorporators.

The Gressington Corporation, care of George Keister, 56 West Forty-fifth Street, New York, has been incorporated with 200 shares of stock, no par value, to manufacture and deal in iron and steel products. This is an outgrowth of a previous organization. G. Green, M. G. Rodinsky and George Keister are the incorporators.

The Seven-in-One-Wrench Corporation, care of E. N. Baar, 51 Chambers Street, New York, incorporated with $20,000 capital stock, plans to manufacture wrenches and similar tools. It contemplates the establishment of a plant outside of New York, and the maintenance of a branch in New York. Plans will be given more fully in two weeks.

The Ever-Ready Motor Equipment Co., 1176 Flatbush Avenue, Brooklyn, has been incorporated with $25,000 capital stock to act as jobber in automotive equipment and parts. S. Miller, H. E. Tupper and L. Glaubman are the incorporators.

The General Metal Briquette Corporation, 25 Broad Street, New York, has been incorporated with 500 shares of stock, no par value, to manufacture metal products, having taken over the assets of the General Briquetting Co. of the same address. Temporary address is in care of A. L. Stillman, 25 Broad Street.

The Duqueshire Mfg. Co., Grand and Creek Streets, Maston, L. I., incorporated with $50,000 capital stock, is remodeling a plant at that address and plans to produce wind shields and other automotive equipment. W. B. Dukeshire and A. Bernardik are the incorporators.

The Continental Silver Corporation, New York, incorporated with $100,000 capital stock to manufacture metal plated wares, is developing organization matters and has no definite plans under way as yet for manufacturing. W. C. Newland and A. E. Warshavsky are the incorporators. Address in care of A. P. Bersohn, 25 West Forty-third Street.

The Sunray Steel Wool Co., care of Charles Ludwig, 8 West Fortieth Street, New York, has been incorporated with $50,000 capital stock to manufacture special steel wool. Arrangements are under way for the establishment of a plant and equipment. Charles and E. Ludwig are the incorporators.

The Kemp Oil Burner Co., 3611 Fourteenth Avenue, Brooklyn, incorporated with $80,000 capital stock, has obtained a factory, installed equipment and will begin operations at once on the manufacture of oil burning equipment.

The Independent Metal Strap Co., Inc., 313 East Twenty-second Street, New York, recently organized to manufacture box strappings, fasteners and specialties for the shipping room, is an outgrowth of the old Independent Metal Strap Co., organized in 1907 and whose entire plant was sold to the Wire & Steel Products Co. in 1919. Sidney J. Ornston, president and I. Emanuel, secretary-treasurer of the latter company, are the holding interests for the Independent company. The parent company also previously bought the American Box Strapping Co., formerly at 275 Water Street, New York. Each company has its individual account.

The Doring Co., Inc., 350 Broadway, New York, recently organized with $100,000 capital stock, will manufacture a new gear-brake, which will be applicable not only to moving vehicles but also to hoisting machinery, elevators and automatic machinery. Albert B. Doring is secretary-treasurer.

J. F. Buhr has opened an office in the Blodgett Engineering & Tool Co. Building, Fourteenth and Dalzelle Street, Detroit, and will do business as the J. F. Buhr Machine Tool Co., which will act as sales representative for the Blodgett company, manufacturer of ball-bearing multiple drillers.

The Rova Radio Corporation, 167 West Eighteenth Street, New York, has been incorporated with 150,000 shares of no par value stock, 75,000 of which recently were issued through Carden, Green & Co., New York Stock Exchange firm, and will be a holding company for numerous distributors of radio equipment throughout the country. Twelve such branches already have been established in New York.

The Bronze Piston Ring Co., 910 North Illinois Street, Indianapolis, recently organized, has secured a factory and completed the installation of machinery for manufacturing a one-piece bronze piston ring. Operations will be started at once. A. A. Bouvey heads the company.

S. A. Ashman & Sons Co., Philadelphia, is a reorganization of the Delaware Valley Forge, Inc., 2300 East Tioga Street, Philadelphia. The officers are as follows: W. W. Sketchley, president and treasurer; Robert J. Brady, secretary, and C. W. Long, assistant secretary and superintendent. The forge plant will remain at the same address.

The Quaker City Tank Line, 411 Olive Street, St. Louis, has been organized to operate a tank car line, its principal business consisting of leasing tank cars. G. F. Wood-Smith is one of the principals.

The Tuscaloosa Iron Works Co., Inc., Tuscaloosa, Ala., has been incorporated with $100,000 capital stock as a reorganization of the Tuscaloosa Iron Works of which J. W. Thomson was sole owner. Its product will be a small steam portable saw mill with engine, boiler and husk frame all mounted on a single frame. The boiler used will be one similar to the type used in steam automobiles. Present plans consist of foundry and machine shop, pattern department and assemblying department.

The Oil Appliances Co., 100 Sip Avenue, Jersey City, N. J., has been organized as direct factory representative for manufacturers of heating equipment and oil systems. A. J. Passino is manager.

The Plomb Tool Co., 2209 Santa Fe Avenue, Los Angeles, Cal., has been organized to manufacture hand forged tools and in addition will carry a large line of special wrenches designed for the garage trade. All manufacturing is for stock. Morris B. Pendleton is one of the principals.

The American Radio Cabinet Co., 923 Locust Street, Philadelphia, recently organized, is manufacturing various types of radio cabinets.

The J. E. Perkins Co., 113 East Franklin Street, Baltimore, Md., has been organized as direct factory representative, handling motor control apparatus, resistance units, temperature controls, radiator and steam traps and various other electrical equipment.

The Lincoln Service & Repair Co., care of Joseph R. Woodruff, 20 Lincoln Street, Newark, N. J., has been incorporated with $100,000 capital stock to operate an automobile repair plant, specializing on Lincoln automobiles. It will also act as distributor of automotive products.

The Adcox Mfg. Co., Inc., 1314 McGee Street, Kansas City, Mo., has been organized with $66,000 capital stock to manufacture various types of heating equipment, hot air furnaces, steam boilers and special burners. A. H. Adcox is president and H. M. Bayne, secretary-treasurer.

The Stonecrafters, Inc., Bridgeton, N. J., has been organized to manufacture reconstructed stone products. It is the intention of the company to manufacture in a plant of its own located in Bridgeton. Douglas V. Aitken, Farmers and Merchants National Bank Building, Bridgeton, is secretary.

The Kearney & Trecker Corporation, Milwaukee, and the Landis Tool Co., Waynesboro, Pa., have moved their Chicago offices to 618-622 West Washington Boulevard, where they will share office and display space with Warner & Swasey, Cleveland. Martin J. Luther is in charge of the Kearney & Trecker office, while W. R. Fortney has charge for the Landis Tool Co.

Current Metal Prices

On Small Lots, Delivered from Merchants' Stocks, New York City

The following quotations are made by New York City warehouses.

As there are many consumers whose requirements are not sufficiently heavy to warrant their placing orders with manufacturers for shipments in carload lots from mills, these prices are given for their convenience.

On a number of items the base price only is given, it being impossible to name every size.

The wholesale prices at which large lots are sold by manufacturers for direct shipment from mills are given in the market reports appearing in a preceding part of THE IRON AGE under the general heading of "Iron and Steel Markets" and "Non-Ferrous Metals."

Bars, Shapes and Plates

	Per Lb.
Bars:	
Refined iron bars, base price	3.24c.
Swedish charcoal iron bars, base	6.75c. to 7.00c.
Soft steel bars, base price	3.24c.
Hoops, base price	4.49c.
Bands, base price	3.99c.
Beams and channels, angles and tees, 3 in. x ¼ in. and larger, base	3.34c.
Channels, angles and tees under 3 in. x ¼ in., base	3.24c.
Steel plates, ¼ in. and heavier	3.34c.

Merchant Steel

	Per Lb.
Tire, 1½ x ½ in. and larger	3.25c.
(Smooth finish, 1 to 2½ x ¼ in. and larger)	3.50c.
Toe-calk, ½ x ⅜ in. and larger	4.20c.
Cold-rolled strip, soft and quarter hard	7.00c.
Open-hearth spring steel	4.50c. to 7.00c.
Shafting and Screw Stock:	
Rounds	4.15c.
Square, flats and hex	4.65c.
Standard tool steel, base price	15.00c.
Extra tool steel	18.00c.
Special tool steel	23.00c.
High-speed steel, 18 per cent tungsten	70c.

Sheets

Blue Annealed

	Per Lb.
No. 10	3.89c.
No. 12	3.94c.
No. 14	3.99c.
No. 16	4.09c.

Box Annealed—Black

	Soft Steel C. R., One Pass Per Lb.	Blued Stove Pipe Sheet Per Lb.
Nos. 18 to 20	4.30c to 4.45c.	.....
Nos. 22 and 24	4.45c. to 4.60c.	5.10c.
No. 26	4.50c. to 4.65c.	5.15c.
No. 28*	4.60c. to 4.75c.	5.25c.
No. 30	4.70c. to 4.95c.	.....

Galvanized

	Per Lb.
No. 14	4.70c. to 4.85c.
No. 16	4.85c. to 5.00c.
Nos. 18 and 20	5.00c. to 5.15c.
Nos. 22 and 24	5.15c. to 5.30c.
No. 26	5.30c. to 5.45c.
No. 28*	5.60c. to 5.75c.
No. 30	6.10c. to 6.25c.

*No. 28 and lighter, 36 in. wide, 20c. higher.

Welded Pipe

Standard Steel	Black	Galv.	*Wrought Iron*	Black	Galv.
⅛ in. Butt...	—41	—24	½ in. Butt...	— 4	+19
¼ in. Butt...	—46	—32	¾ in. Butt...	—11	+ 9
1-3 in. Butt..	—48	—34	1-1½ in. Butt.	—14	+ 6
2½-6 in. Lap.	—44	—30	2 in. Lap....	— 5	+14
7-8 in. Lap...	—41	—11	2½-6 in. Lap.	— 9	+ 9
9-12 in. Lap..	—34	— 6	7-12 in. Lap..	— 3	+16

Bolts and Screws

Machine bolts, cut thread,
50 to 60 and 10 per cent off list
Carriage bolts, cut thread,
40 to 40, 10 and 10 per cent off list
Coach screws, 50 and 10 to 65 per cent off list
Wood screws, flat head iron,
75, 20 and 10 per cent off list

Steel Wire

BASE PRICE* ON No. 9 GAGE AND COARSER	Per Lb.
Bright, basic	4.25c. to 4.50c.
Annealed soft	4.50c. to 4.75c.
Galvanized annealed	5.15c. to 5.40c.
Coppered basic	5.15c. to 5.40c.
Tinned soft Bessemer	6.15c. to 6.40c.

*Regular extras for lighter gage.

Brass Sheet, Rod, Tube and Wire

BASE PRICE

High brass sheet	16¼c. to 17¼c.
High brass wire	16¾c. to 17¾c.
Brass rods	14 c. to 15 c.
Brass tube, brazed	24¼c. to 25¼c.
Brass tube, seamless	20½c. to 21½c.
Copper tube, seamless	21¾c. to 22¾c.

Copper Sheets

Sheet copper, hot rolled, 19½c. to 20c. per lb. base.

Cold rolled, 14 oz. and heavier, 3c. per lb. advance over hot rolled.

Tin Plates

Bright Tin		Coke—14 x 20	
Grade "AAA" Charcoal 14x20	Grade "A" Charcoal 14x20	Prime	Seconds
		80 lb..	$6.55 $6.30
		90 lb..	6.65 6.40
		100 lb..	6.75 6.50
IC..	$11.75 $9.50	IC..	7.00 6.75
IX..	13.25 11.50	IX..	8.25 8.00
IXX..	14.50 12.50	IXX..	9.50 9.25
IXXX..	15.50 13.75	IXXX..	10.75 10.50
IXXXX..	16.50 14.75	IXXXX..	12.00 10.75

Terne Plates

8 lb. coating, 14 x 20

100 lb	$7.00 to $8.00
IC	7.25 to 8.25
IX	8.25 to 8.75
Fire door stock	9.00 to 10.00

Tin

Straits, pig	48c.
Bar	50c. to 60c.

Copper

Lake ingot	16 c.
Electrolytic	15½c.
Casting	14½c.

Spelter and Sheet Zinc

Western Spelter	7½c.
Sheet zinc, No. 9 base, casks	10½c. open 11¼c.

Lead and Solder*

American pig lead	8¼c. to 8¾c.
Bar lead	11c. to 12c.
Solder, ½ and ½ guaranteed	33¼c.
No. 1 solder	31¼c.
Refined solder	27¼c.

*Prices of solder indicated by private brand vary according to composition.

Babbitt Metal

Best grade, per lb.	75c. to 90c.
Commercial grade, per lb.	35c. to 50c.
Grade D, per lb.	25c. to 35c.

Antimony

Asiatic	10½c. to 11c.

Aluminum

No. 1 aluminum (guaranteed over 99 per cent pure), in ingots for remelting, per lb.	36c.

Old Metals

The market is stronger and inquiries more plentiful. Dealers' buying prices are nominally as follows:

	Cents Per Lb.
Copper, heavy crucible	10.75
Copper, heavy wire	10.25
Copper, light bottoms	8.25
Brass, heavy	6.00
Brass, light	5.00
Heavy machine composition	7.75
No. 1 yellow brass turnings	6.50
No. 1 red brass or composition turnings	7.50
Lead, heavy	6.00
Lead, tea	4.25
Zinc	3.50
Cast aluminum	15.00
Sheet aluminum	15.00